Vol. 999 Number 3

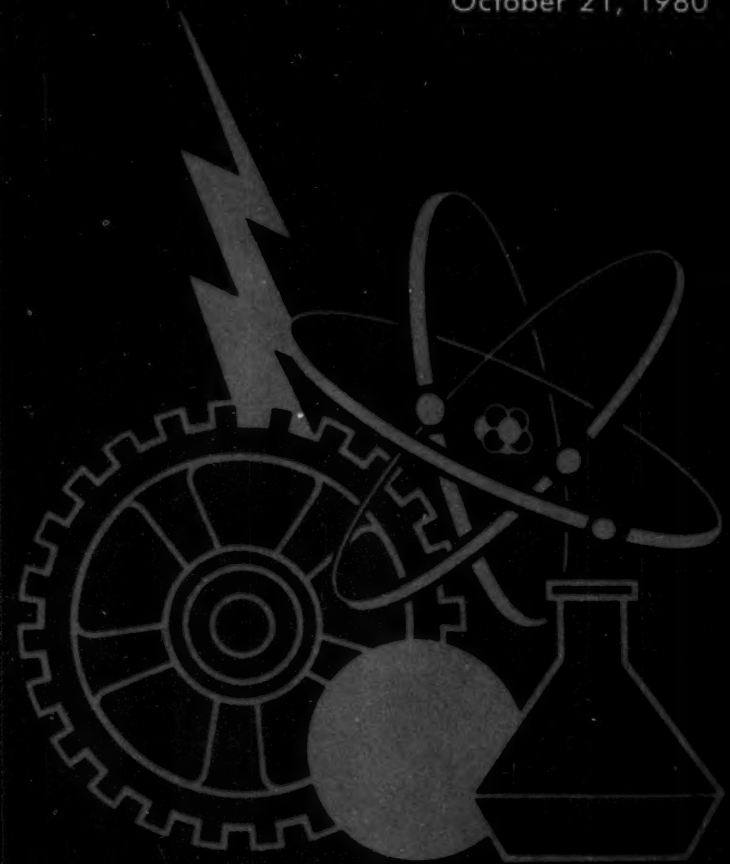
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 21, 1980



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 21, 1980 Volume 999 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,935,959, Re. S.N. 168,978, Filed Jul. 14, 1980, Cl. 220/22, CONTAINER FOR BULK TOBACCO, William R. Long, Owner of Record: *Long Mfg. N.C. Inc., Tarboro, N.C.*, Attorney or Agent: A Yates Dowell, Jr., et al., Ex. Gp.: 241

4,109,712, Re. S.N. 163,231, Filed Jun. 25, 1980, Cl. 166/340, SAFETY APPARATUS FOR AUTOMATICALLY SEALING HYDRAULIC LINES WITHIN A SUB-SEA WELL CASING, A. Michael Regan, Owner of Record: *Regan Offshore International Inc., Torrance, Calif.*, Attorney or Agent: Robert A. Felsman, et al., Ex. Gp.: 354

4,155,929, Re. S.N. 163,702, Filed Jun. 27, 1980, Cl. 260/465.1, PROCESS FOR THE PREPARATION OF AN ACETONITRILE DERIVATIVE, Michel Chignac, et al., Owner of Record: *Labaz, Paris, France,* Attorney or Agent: Richard D. Mason, et al., Ex. Gp.: 121

4,168,798, Re. S.N. 165,132, Filed Jul. 1, 1980, Cl. 239/121, FULL COVERAGE RECIRCULATING SPRAYER, John O. Moore, et al., Owner of Record: *Sprayrite Manufacturing Company, West Helena, Ark.*, Attorney or Agent: James Van Santen, et al., Ex. Gp.: 313

4,182,362, Re. S.N. 161,128, Filed Jun. 19, 1980, Cl. 137/340, DIFFERENTIAL TRANSMITTER AND MANIFOLD MOUNTING, John E. Hewson, et al., Owner of Record: *Anderson Greenwood & Co., Houston, Tex.*, Attorney or Agent: Jack R. Springgate, et al., Ex. Gp.: 341

4,186,137, Re. S.N. 163,500, Filed Jun. 27, 1980, Cl. 549/79, PROCESS FOR PREPARING 3-THIENYL-ACETATE DERIVATIVES, Charles Pigerol, et al., Owner of Record: *Labaz, Paris, France,* Attorney or Agent: Richard D. Mason, et al., Ex. Gp.: 122 , Pub. Oct. 21, 1980

PATENT NOTICES

Certificates of Correction for the Week of Oct. 21, 1980

D. 255,236	4,194,935	4,204,540	4,209,574
D. 256,041	4,195,220	4,204,663	4,210,188
3,923,638	4,196,265	4,205,124	4,210,953
4,064,048	4,196,288	4,205,614	4,210,990
4,074,814	4,198,545	4,205,967	4,211,182
4,108,983	4,198,707	4,206,002	4,211,636
4,138,194	4,199,142	4,206,258	4,211,699
4,140,793	4,199,528	4,206,393	4,211,761
4,163,183	4,199,642	4,206,846	4,211,806
4,168,258	4,200,021	4,207,125	4,212,345
4,168,267	4,200,488	4,207,140	4,212,518
4,169,946	4,201,861	4,207,471	4,212,696
4,174,207	4,201,816	4,208,010	4,213,242
4,175,180	4,202,558	4,208,539	4,213,374
4,176,927	4,202,600	4,208,780	4,213,383
4,178,465	4,202,621	4,208,931	4,213,920
4,182,548	4,203,343	4,208,989	4,214,255
4,188,436	4,203,626	4,209,133	4,214,286
4,192,062	4,203,786	4,209,239	4,214,594
4,192,688	4,203,986	4,209,520	4,216,426
4,192,785	4,204,003		

Disclaimers

3,740,403.—*Keith Chadwick Murdock*, Pearl River, N.Y. 3,6-bis - (DIALKYLAMINOALKOXY)ACRIDINES. Patent dated June 19, 1973. Disclaimer filed July 18, 1980, by the assignee, *American Cyanamid Company*.

Hereby enters this disclaimer to claim 3 of said patent.

3,402,086.—*William P. Smith*, Lake Jackson and *Donald J. Endsley*, Clute, Tex. HOT-MELT EXTRUSION COATING PROCESS. Patent dated Sept. 17, 1968. Disclaimer filed Oct. 3, 1977, by the assignee, *The Dow Chemical Company*.

Hereby enters this disclaimer to claims 1, 2, 3, 5 and 6 of said patent.

3,838,404.—*Richard H. Heeren*, Palatine, Ill. RANDOM ACCESS MEMORY SYSTEM AND CELL. Patent dated Sept. 24, 1974. Disclaimer filed June 27, 1977, by the assignee, *Teletype Corporation*.

Hereby enters this disclaimer to claims 16, 24 through 35, inclusive, 37 through 41, inclusive and 44 through 50, inclusive of said patent.

National Technical Information Service

Government-Owned Inventions

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

Douglas J. Campion,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. Department of Agriculture

Program Agreements and Patent Branch, Administration Service Division Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–110,860. Controlled Release of Bioactive Materials Using Alginate Gel Beads. Filed Jan. 9, 1980.

Patent application 6–140,911. Anti-Feedant for Boll Weevils. Filed Apr. 16, 1980.

Patent 4,203,892. Method of Protecting Proteins for Animal Feed. Filed Apr. 17, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,204,008. Preparation of Protein Concentrates From Whey and Seed Products. Filed Dec. 28, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,204,043. Method of Removing Pigment From Annatto Seed. Filed Apr. 4, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,205,602. Apparatus for Tying Cauliflower. Filed Dec. 19, 1978. Patented June 3, 1980. Not available NTIS.

U.S. Department of Health and Human Services

National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20205

Patent 4,178,285. Separation of Active α_1-Acid Glycoprotein and Utilization in the Lipoprotein Lipase Enzyme System. Filed Dec. 20, 1978. Patented Dec. 11, 1979. Not available NTIS.

Patent 4,183,864. Cobalt Catalyzed Steroid Synthesis. Filed Feb. 21, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,200,806. Scanning Flow Indicator for Rotameters. Filed Apr. 25, 1978. Patented Apr. 29, 1980. Not available NTIS.

U.S. Department of the Navy

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 6–086,213. Diamond Supported Helix Assembly and Method. Filed Oct. 18, 1979.

Patent application 6–091,224. Automatic Parachute Release System. Filed Nov. 6, 1979.

Patent application 6–116,351. A New Method for Preparing Pentanitroaniline and Triaminotrinitrobensenes From Trinitrotoluene. Filed Jan. 28, 1980.

Patent application 6–121,550. Transducer Array Release and Pressure Compensation System. Filed Feb. 14, 1980.

Patent application 6–130,804. A Simplified Multilayer Circuit Board. Filed Mar. 17, 1980.

Patent application 6–133,753. Electrical Connector Receptacle Assembly. Filed Mar. 25, 1980.

Patent application 6–135,563. Bonding Agent for HMX (Cyclotetromethylenetetranitramine). Filed Mar. 31, 1980.

Patent application 6–137,226. Portable Battery Operated Smoke Generator. Filed Apr. 4, 1980.

Patent application 6–137,227. Nontoxic Smoke Generator. Filed Apr. 4, 1980.

Patent application 6–141,703. Apparatus and Method for Radio Channel Selection. Filed Apr. 18, 1980.

Patent application 6–143,079. Automatic Temperature Control System for Diver Heating System. Filed Apr. 4, 1980.

Patent application 6–143,707. Dynamics Parachute Four-Line Release Simulator. Filed Apr. 25, 1980.

National Aeronautics and Space Administration

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent 4,193,435. Floating Nut Retention System. Filed Aug. 31, 1978. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,195,666. Quartz Ball Valve. Filed Aug. 31, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,199,764. Dual Band Combiner for Horn Antenna. Filed Jan. 31, 1979. Patented Apr. 22, 1980. Not available NTIS.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 738–5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862–1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 6, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus: Metal Stock: Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-25-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides: Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming: Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-27-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	4-16-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	10-10-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-4-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-24-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports: Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements, Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during September 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,102,270 to 3,105,236, inclusive
Plant Patents ..... Numbers 2,277 to 2,280, inclusive

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 4, 1986

PATENT EXAMINING GROUPS

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,418

OPTO-ELECTRONIC IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

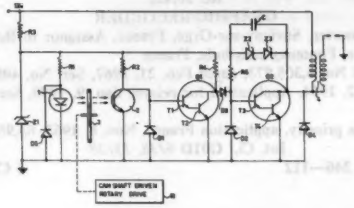
Eric H. Ford, London, England, assignor to Lumenition Limited, London, England

Original No. 4,122,814, dated Oct. 31, 1978, Ser. No. 820,744, Aug. 1, 1977. Continuation-in-part of Ser. No. 655,138, Feb. 3, 1976, abandoned. Application for reissue Mar. 1, 1979, Ser. No. 16,369

Claims priority, application United Kingdom, Feb. 12, 1975, 6028/75

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—651 **11 Claims**



1. An opto-electronic ignition system for controlling switching of the primary winding of an ignition coil of an internal combustion engine and capable of reliable operation at temperatures above about 125° C., said system comprising a source of radiation; a photo-transistor sensitive to radiation which will switch on or conduct when exposed to the radiation and switch off when the radiation is cut off; means disposed between said source and said photo-transistor for intermittently blocking radiation from said source in timed relation to the engine revolutions so as to control the periods during which radiation is received by said photo-transistor; and a switching circuit for controlling switching of the ignition coil responsive to the output of said photo-transistor; said switching circuit comprising a plurality of pairs of transistors the components of each pair being connected in a Darlington configuration and means for connecting said pairs of transistors to each other between said photo-transistor and the ignition coil such that each Darlington pair switches in inverse relationship to at least one other Darlington pair and a first Darlington pair switches in inverse relationship to said photo-transistor, so as to cause fast switching of the primary winding of the ignition coil thereby inducing a spark voltage in the second winding of the coil.

Re. 30,419

APPARATUS AND METHOD FOR TRANSMITTING ELEMENTS TO ARTICLES

Michael Crankshaw, Santa Fe Springs; Leo Kucheck, Irvine, and Donald L. Caudill, Riverside, all of Calif., assignors to Label-Aire Inc., Fullerton, Calif.

Original No. 4,089,725, dated May 16, 1978, Ser. No. 786,186, Apr. 11, 1977. Continuation-in-part of Ser. No. 699,264, Jun. 24, 1976, Pat. No. 4,024,011. Application for reissue Dec. 14, 1978, Ser. No. 969,301

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.[2] B32B *31/00*

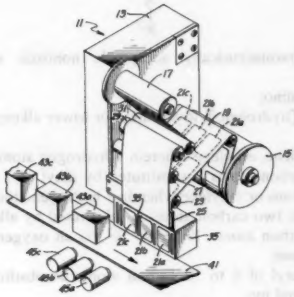
U.S. Cl. 156—249 **20 Claims**

18. A method of transferring elements to articles comprising:

repetitively supplying elements to a plurality of positions with such positions being arranged in a sequence which defines a row at a work station and with a first of said positions being next in said sequence to a second of said positions, first and second of said elements being supplied to said first and second positions, respectively;

with said first and second elements releasably retained at the first and second positions, respectively, advancing a plurality of articles, including first and second articles in a sequence, through said work station generally from one end of said row to the other end of said row with said first article being next in the sequence of articles to the second article and with the first article leading the second article, said other end of said row being closer to said first position than to said second position;

said step of advancing including advancing said first article past said second element at said second position; and



transferring the first and second elements from the first and second positions to said first and second articles, respectively, as the articles are advanced through the work station and preventing the transfer of elements from the first and second positions to the second and first articles, respectively, as the articles are advanced through the work station.

19. An apparatus for transferring elements to articles which are moved in a first direction through a station wherein a first of the articles leads a second of the articles through the station, said apparatus comprising:

means for releasably retaining first and second of the elements at first and second positions with said positions defining a row at said station, the axis of the row extending generally in said first direction and the first position being downstream, in the direction of article movement, of said second position;

sensor means responsive to the location of at least one of the first and second articles for providing a control signal;

means for transferring the elements from the retaining means to the articles as the articles are moved through said station; and

control means responsive to said control signal for controlling said transferring means so that said transferring means transfers the first element to the first article and the second element to the second article, said control means preventing the transfer of elements to the first and second articles at the second and first positions, respectively.

Re. 30,420
PYRAZOL-5-ONES

Eike Möller, Wuppertal, Fed. Rep. of Germany; Karl-August Meng, deceased, late of Wuppertal, Fed. Rep. of Germany by Ilse Heide Frieda Meng, heir and legal representative; Egbert Wehinger, Velbert, Fed. Rep. of Germany, and Harald Horstmann, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

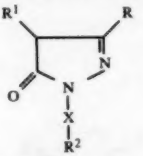
Original No. 4,000,294, dated Dec. 28, 1976, Ser. No. 632,165, Nov. 14, 1975. Division of Ser. No. 461,285, Apr. 15, 1974, Pat. No. 3,952,008. Application for reissue Feb. 4, 1977, Ser. No. 765,666

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1973, 2319279; Dec. 17, 1973, 2363138

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 P **22 Claims**

1. A pharmaceutical composition useful for effecting diuresis or saluresis in humans and animals and for treating hypertension in humans and animals which comprises a diuretically effective amount, a saluretically effective amount or an antihypertensive amount of a compound of the formula



I

or a pharmaceutically acceptable nontoxic salt thereof, wherein

R is amino;

R^1 is [hydrogen,] lower alkyl or lower alkenyl;

X is

ethylene, ethylene wherein 1 hydrogen atom on 1 of the carbon atoms is substituted by alkyl of 1 to 4 carbon atoms or ethylene wherein 1 hydrogen atom on each of the two carbon atoms is substituted by alkyl of 1 to 4 carbon atoms, linked to R^2 via an oxygen or sulphur atom;

R^2 is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms and lower alkoxy;

b. cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro or

d. nitro, and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lwer alkoxy, halogen and trifluoromethyl

in combination with a pharmaceutically-acceptable, nontoxic, inert diluent or carrier.

Re. 30,421
PROCESS FOR PREPARING N-ALKOXYCARBONYL-N-ALKYLCYANAMIDE

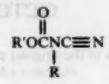
Charles D. Adams, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,138,585, dated Feb. 6, 1979, Ser. No. 874,354, Feb. 1, 1978. Application for reissue Oct. 11, 1979, Ser. No. 83,646

Int. Cl.[3] **C07C** *125/065*

U.S. Cl. 560—159 **7 Claims**

1. In a process for preparing N-[ethoxycarbonyl]*alkoxycarbonyl*-N-alkylcyanamides of the formula



wherein R is alkyl of 1–3 carbon atoms and R′ is alkyl of 1–3 carbon atoms by mixing an aqueous solution of an alkali or alkaline earth metal salt of N-alkoxycarbonyl cyanamide with a di-C_{1-3} alkyl sulfate, the improvement which comprises mixing said aqueous solution with said di-C_{1-3} alkyl sulfate in the presence of at least about 0.1 mole % of quaternary hydrocarbyl ammonium ions per mole of N-alkoxycarbonyl-cyanamide, the hydrocarbyl moieties being selected from the group consisting of alkyl, aryl, alkaryl and aralkyl groups having a total carbon content of from 7 to 60 carbon atoms.

Re. 30,422
GRAPHIC RECORDER

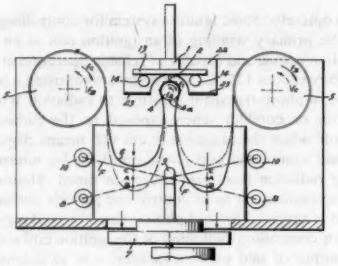
Jean Mourier, Savigny-sur-Orge, France, Assignor to Benson-France, Fontenay-sous-bois, France

Original No. 3,305,873, dated Feb. 21, 1967, Ser. No. 408,159, Nov. 2, 1964. Application for reissue Jan. 9, 1979, Ser. No. 2,144

Claims priority, application France, Nov. 8, 1963, 63.953207

Int. Cl.[3] **G01D** *9/38, 15/28*

U.S. Cl. 346—112 **5 Claims**



4. An instrument for graphically recording information by providing a visually perceptable image on a web of flexible, wide sheet material comprising:

a pair of spools with flexible wide sheet material extending therebetween,

a head for graphically transferring information onto said flexible material,

means for displacing said head in two different transverse directions across at least a portion of the width of said flexible material during transferring of information,

a driving means located opposite said head for contacting said flexible material between said spools and for moving said flexible material in two different longitudinal directions past said head during transferring of information, said directions being perpendicular to the displacement of said head,

said driving means including a control spindle of low rotational inertia and having a minimum diameter compatible with the flexibility of said flexible material,

and air pressure means to hold said flexible material against a portion of the surface of said control spindle and applied between said control spindle and each of said pair of spools forming loops therebetween and isolating said control spindle from the inertial action of said spools, whereby said control spindle and said air pressure means cooperate to positively control movement of said flexible material past said head without the use of any other drive means for said flexible material.

PLANT PATENTS

GRANTED OCTOBER 21, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,602

PLANT VARIETY OF THE ACANTHUS FAMILY

Barnell L. Cobia, P.O. Box 1307, Winter Garden, Fla. 32707

Filed May 7, 1979, Ser. No. 36,541

Int. Cl.[3] A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct variety of the Acanthus family substantially as herein shown and described.

PATENTS

GRANTED OCT. 21, 1980

ERRATA

For CLASS	See PATENT NO.
052–035	4,228,552
119–001	4,228,554
368–028	4,228,644
368–075	4,228,645
368–066	4,228,646
368–185	4,228,647
368–185	4,228,648
368–093	4,228,649
474–012	4,228,691
474–251	4,228,692
081–460	4,228,723
440–086	4,228,760
123–437	4,228,788
568–380	4,229,377
568–313	4,229,378
568–437	4,229,379
568–435	4,229,380
568–454	4,229,381
428–113	4,229,472
428–113	4,229,473
428–162	4,229,474
428–196	4,229,475
428–201	4,229,476
370–084	4,229,621
370–081	4,229,622
370–004	4,229,623
375–088	4,229,698
370–024	4,229,741

PATENTS

GRANTED OCT. 21, 1980

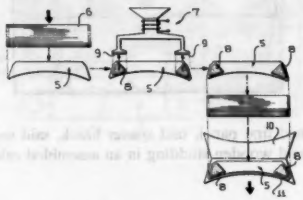
ERRATA

PATENTS

GRANTED OCTOBER 21, 1980

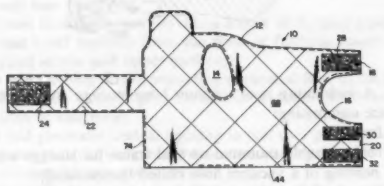
GENERAL AND MECHANICAL

4,228,547
REINFORCED CLOTHING COMPONENT AND METHOD OF MAKING SAME
Paul G. Peterson, 52 Bruce St., Kitchener, Ontario, Canada (N2B 1Y5)
Continuation of Ser. No. 747,957, Dec. 6, 1976, abandoned. This application Jan. 30, 1979, Ser. No. 7,770
Int. Cl.[2] A41B *3/00*
U.S. Cl. 2—129 **9 Claims**



1. A method of reinforcing an article of clothing such as a shirt collar and cuffs, said method comprising the steps of forming a clothing component in a customary manner, applying a reinforcing coating of heated thermoplastics material to the formed clothing component in a definite preselected pattern to accomplish the desired reinforcement, then incorporating the clothing component with another clothing component in the making of an article, and the thermoplastics material being self-bonding to the first-mentioned and another clothing component.

4,228,548
ATHLETIC GLOVE
David L. Cohen, 6517 Tower Dr., Apt. T-3, Alexandria, Va. 22306
Filed Mar. 28, 1978, Ser. No. 891,135
Int. Cl.[2] A41D *19/00*; A43D *5/00*
U.S. Cl. 2—161 A **4 Claims**

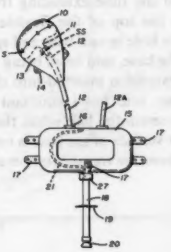


1. An athletic glove comprising:
a glove body adapted to be disposed upon an arm extremity within the vicinity of the arm wrist; and
means operatively associated with said glove body for positively restraining movement of said wrist with respect to and for fixing said wrist in a predetermined disposition, wherein said restraining means comprises a first rigid brace operatively engaged with the interior, palm-side of said extremity; and a second rigid brace operatively engaged with the exterior, back side of said extremity, wherein said second brace has a longitudinal extent such that the same overlies a portion of the arm of said extremity, the wrist of said extremity, and the first joint of the hand fingers,
whereby when said extremity is moved through a particular motion, the hand, wrist, and arm portions of said extrèmity move in unison.

4,228,549
DEODORIZER FOOTWEAR
John L. Rispoli, 1304 Huron Ave., New Castle, Pa. 16101
Filed Aug. 31, 1977, Ser. No. 829,522
Int. Cl.[2] A41B *11/00*; A43B *17/00*
U.S. Cl. 2—239 **5 Claims**

1. As a new article of manufacture an article of footwear comprising a sock or stocking, said article formed of a fabric, the yarns of said fabric formed of synthetic resin containing activated charcoal particles homogeneously distributed therein, said charcoal particles being present in, on and extending from the surface of said yarns in an amount effective to absorb odors when said article is subjected to contact with foot perspiration and to a passage of odor filled air through said fabric.

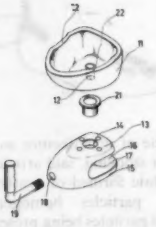
4,228,550
DISTAL URINARY REPLACEMENT PROSTHESIS
Henry Salkind, 3415 Fifth Ave., Youngstown, Ohio 44505
Filed Jun. 29, 1979, Ser. No. 53,431
Int. Cl.[3] A61F *1/24*
U.S. Cl. 3—1 **13 Claims**



1. A surgically implantable distal urinary replacement prosthesis for the collection and removal of urine from at least one kidney in a patient's body and comprising at least one flexible cone-shaped sheath having a first open end arranged for engagement about and attachment to at least a portion of said kidney so as to enclose the renal pelvis area thereof, a second end of said cone-shaped sheath being spaced from said renal pelvis area, a flexible tubular replacement ureter positioned partially within said cone-shaped sheath and extending outwardly thereof through said second end thereof and attached thereto in sealing relation, an end of said flexible tubular replacement ureter located within said cone-shaped sheath and arranged for engagement over a ureter in said renal pelvis area

and adapted to be attached thereto, openings in said flexible tubular replacement ureter within said flexible cone-shaped sheath so that liquid within said flexible cone-shaped sheath can flow into said tubular replacement ureter, a tank forming a replacement bladder, said tubular replacement ureter being in communication with said tank and a flexible tubular member communicating with said tank and forming a discharge passageway extending therefrom.

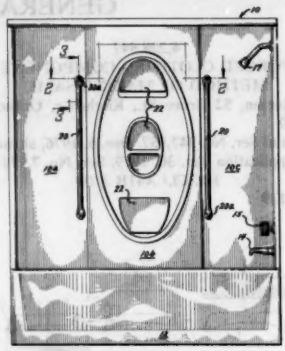
4,228,551
BABY TOILET
Lee Chiung-Feng, No. 103 Wutsang St. Sec. 2, Taipei, Taiwan
Filed Mar. 26, 1979, Ser. No. 23,535
Int. Cl.[3] A47K *11/02*
U.S. Cl. 4—484 **6 Claims**



1. A portable toilet employing a flexible bag, comprising: a toilet bowl, said bowl having a flat bottom of uniform thickness, said bowl having a hole in said flat bottom and a tube extending from the outer surface of said bottom, said tube communicating with said bowl through said hole in the bottom; a base having an upper and a lower surface, said upper surface having an outer contour which is substantially identical to the inner contour of said bowl, said base having a hole therethrough from said upper surface to said lower surface located at the same position as the hole in said bowl, said hole at the upper surface of said base being of sufficient diameter to permit insertion of the tube extending from said bowl therethrough, wherein the top of the flexible bag is inserted upwardly through the hole in said base and spread partly over the upper surface of the base, said bowl being placed over the base with the tubular extension inserted into the hole in the upper surface of the base, said bowl and said base being pressed firmly together to retain the bag while the toilet is in use, and wherein said upper surface of the base is inserted into said bowl by inverting said base for transportation and storage.

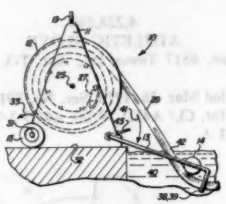
4,228,552
BATHTUB WALL-SURROUND
Charles S. Weaver, Jr., Evansville, Ind., assignor to Peerless Pottery, Inc., Evansville, Ind.
Continuation of Ser. No. 544,869, Jan. 29, 1975, abandoned. This application Jun. 7, 1976, Ser. No. 693,143
Int. Cl.[3] A47K *3/00, 3/16*
U.S. Cl. 52—35 **3 Claims**

1. A wall-surround installed on wooden studding comprising a first panel and a second panel each having substantially coplanar front surfaces and where a side edge of said first panel and an adjacent side edge of said second panel are in a spaced-apart overlapping relationship to define a receiving space, a spacer block disposed within said receiving space, a grab bar, and threaded mounting means for said grab bar extending



through said first panel, said spacer block, said second panel and into said wooden studding in an assembled relationship.

4,228,553
STORAGE AND DISPENSING APPARATUS FOR SWIMMING POOL VACUUM HOSE
Luther L. Genuit, 6231 Calle Del Paisano, Scottsdale, Ariz. 85251
Filed Nov. 6, 1978, Ser. No. 957,899
Int. Cl.[3] E04H *3/20;* **B65H** *75/40*
U.S. Cl. 4—490 **14 Claims**



1. A swimming pool vacuum hose storage and dispensing device comprising:

a frame,

a reel rotatably mounted on said frame for storage and dispensing of a vacuum hose coiled therearound,

a hose submerging means mounted on said frame,

said submerging means being movable to a hose dispensing position where a part of said submerging means is positioned below said frame and in the water of a pool when said device is positioned poolside, and

hose guiding means positioned on said part for guiding and submerging the hose in the water of the pool when dispensed from said reel,

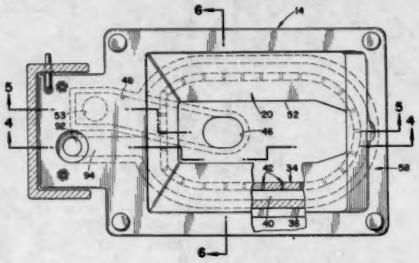
said submerging means comprising at least one arm member pivotally mounted at one end on said frame with its free end being rotatably movable to said hose dispensing position, and

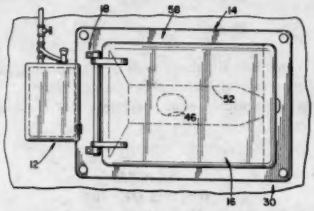
said guiding means comprising a roller mounted on said free end for guiding and submerging the hose when it is passed under said roller during a hose dispensing operation of the device.

4,228,554
TOILET FOR ANIMALS

Anthony J. Tumminaro, 4945 Holly View Dr., Vermilion, Ohio 44089

Filed Apr. 2, 1979, Ser. No. 25,912
Int. Cl.[3] E03D *1/00, 3/00, 5/00*
U.S. Cl. 119—1 3 Claims





1. A toilet comprising:

(a) a user platform having an outer peripheral portion and a generally central opening; said user platform further having an upper surface sloping gradually downwardly from said outer peripheral portion toward said central opening;

(b) flushing means for providing a flow of flushing liquid across said upper surface from adjacent said outer peripheral portion toward said central opening;

(c) a waste receiving bowl beneath said user platform for receiving waste material passing through said opening in said user platform;

(d) said flushing means providing a flow of flushing liquid to said bowl separate from the flow of flushing liquid supplied across said upper surface;

(e) said flushing means providing sequential flow of flushing liquid across said upper surface of said user platform and then to said bowl;

(f) said generally central opening in said user platform comprising a relatively narrow slot extending front to back across said user platform; and

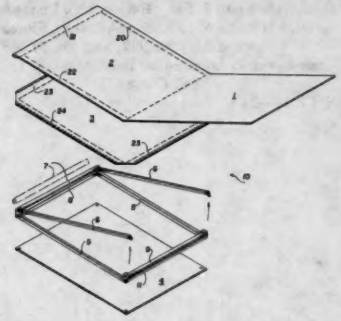
(g) said flushing means including a source of flushing liquid, a liquid supply passage extending around at least a portion of said user platform adjacent said outer peripheral portion thereof, and lateral openings extending from said liquid supply passage to open outwardly at said upper surface of said user platform.

4,228,555
WATER BED SHEET FRAME

Terry A. Katzakian, 101 John Muir Ct., Modesto, Calif. 95350

Filed Apr. 30, 1979, Ser. No. 35,086
Int. Cl.[3] A47C *27/08*
U.S. Cl. 5—498 10 Claims

1. A frame structure for securing sheets to a water bed comprising, a water bed frame defining an interior for supporting a water mattress, removable frame means arranged to be supported on said water bed frame within said interior in overlying relationship with said water mattress with said frame means extending along the top inner periphery of said water bed frame, and sheet means detachably connected to said frame

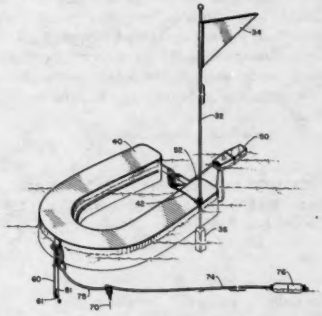


means along the periphery of said sheet means in overlying relationship with said water mattress and within the interior of said water bed frame.

4,228,556
AUTOMATICALLY ENERGIZABLE LIFESAVING EQUIPMENT

Henry H. Searls, 5 Canyon Island Dr., Newport Beach, Calif. 92660

Filed Apr. 10, 1978, Ser. No. 894,692
Int. Cl.[3] B63C *9/20*
U.S. Cl. 9—14 10 Claims



1. In a lifesaving apparatus for unassisted utilization by an overboard person, the combination of: a support securable to a portion of a boat which is accessible to the surface of the body of water being traversed by said boat; a life buoy mounted on said support; a trailing line connected to said life buoy and towed behind said vessel as said vessel traverses said water surface; and connecting means for removably securing said life buoy to said support, said connecting means being capable of sustaining the load imposed thereon as said trailing line is towed by said vessel through the water but being separable when the drag of an overboard individual, grasping the line, is imposed upon said trailing line to cause said life buoy to be released from said support and rendered accessible to said overboard person.

4,228,557

APPARATUS FOR TREATMENT OF THE PERSON

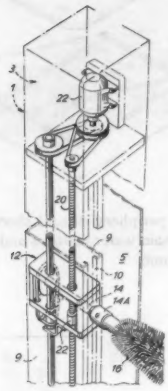
Alessandro De Vivo, Via Bardazzi 33, Florence; Gianni Pierantozzi, Via dei Ciliegi 6, Scandicci, Florence; Diodato Santarpia, Via Conti 9, San Miniato Alto, Pisa, and Renzo Spolverini, Via Roma 65, Rignano Sull'Arno, Florence, all of Italy

Filed May 9, 1979, Ser. No. 37,308

Claims priority, application Italy, May 19, 1978, 9469 A/78

Int. Cl.³ A47K *7/04*

U.S. Cl. 15—21 E **5 Claims**



1. An apparatus for treatment of the person, which comprises a rotatable spindle having mounted thereon a brush means, a fitting carrying the brush means, a structure which is attachable to a wall and incorporates an upwardly extending guiding means for the fitting, a first rotatable, longitudinally extending threaded shaft which cooperates with a female screw fixably attached to said fitting to vertically reciprocate said fitting within the guiding means in response to the clockwise and counterclockwise rotation of said threaded shaft, a second, rotatable, longitudinally extending shaft having a splined outer surface for non-rotational, longitudinal sliding engagement of a transfer means for transferring the rotation of the second longitudinal shaft to the rotatable spindle, and a drive means for simultaneously driving said first and second longitudinally extending shafts.

4,228,558

WATER IMPELLER BRUSH AND MASSAGE

Semen Zhadanov, 2944 W. 5th St., Brooklyn, N.Y. 11224

Filed Feb. 9, 1979, Ser. No. 10,516

Int. Cl.³ A46B *13/04*

U.S. Cl. 15—29 **11 Claims**

1. A shower head; comprising:

a housing including a generally circular portion;

a water inlet opening for said housing and a water outlet opening for said housing;

means for connecting water conduits to said respective inlet and outlet openings;

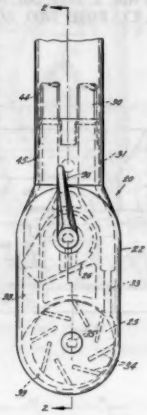
means for passing water out of said housing in the form of a shower spray;

a rotor mounted within and eccentric with respect to said generally cylindrical portion of said housing, said rotor including a base having a plurality of blades mounted thereon, said blades being so positioned that they are rotated by the force of water exiting said inlet opening;

said blades of said rotor extending substantially radially of said rotor but having a gap between the inner end of each blade and the center of said rotor providing a means for dissipation of water under pressure thereinto;

a rotor massage member coupled to said rotor for rotation therewith;

said eccentric mounting of said rotor providing a steadily increasing spacing between the outer ends of said blades of



said rotor and the inner wall of the housing in the area of said generally cylindrical portion to provide further relief for water under pressure as the water is directed to said outlet.

4,228,559

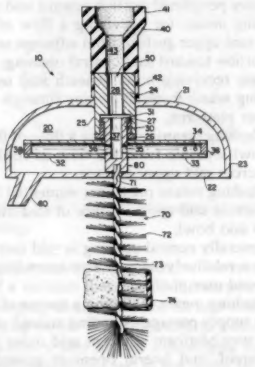
BRUSH DEVICE

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Filed Sep. 6, 1978, Ser. No. 940,303

Int. Cl.³ A46B *13/06;* A47L *15/00*

U.S. Cl. 15—75 **11 Claims**



1. A rotating brush device comprising: a chamber, round in horizontal cross-section, and having a top wall, a bottom wall, and a peripheral side wall joining top and bottom walls; a bearing member attached to said top wall, said bearing member having a bearing surface; a rotatable tubular member having a flange, said flange resting on said bearing surface so that said rotatable tubular member is mounted for rotation in said chamber; at least two tubular arms mounted on said rotatable tubular member for rotation therewith and extending radially outward therefrom for rotation in a substantially horizontal plane in said chamber, said arms each including at least one opening in the walls for discharge of a high velocity stream of water out of a respective tubular arm in a direction to impart rotation of said

arms and said rotatable member; a weighted baffle located at the outer ends of said tubular arms for defining a flow path directing water into a stream flowing in the direction of the water stream discharged from said orifices and also for increasing the rotational inertia and momentum of said arms; said rotatable tubular member forming with each of said tubular arms a conduit for conveying water under pressure through said rotatable tubular member and each of said tubular arms for discharge through said openings in said arms; means for securing said brush device to a water faucet; conduit means for conveying water under pressure from a faucet to which the device is secureable to said rotatable tubular member; water outlet means for removing water from said chamber to permit unobstructed rotation of said horizontal arms in said chamber; a rotatable brush mounted on the device for rotation below the bottom wall of said chamber and extending downwardly therefrom; and means connecting said rotatable brush means and said rotatable tubular member such that rotation of said rotatable brush member caused by rotation of said tubular arms caused by the flow of a high velocity stream of water through said arm openings effects rotation of said brush.

4,228,560

LOWER GUIDE FOR A SLIDING PARTITION

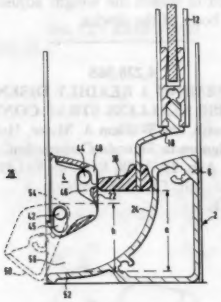
Heinz-Georg Baus, Ulmenweg 46, 3601 Thun, Switzerland

Filed Oct. 19, 1978, Ser. No. 952,676

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747480

Int. Cl.[2] A47H *15/00*

U.S. Cl. 16—90 **5 Claims**



1. Lower guide for a sliding partition for a wet chamber, particularly bath and shower rooms, with sliding doors which are suspended from an upper guide rail and can be pushed together and apart in telescopic fashion and which doors extend down into a guide slot open at the top and confined by an elongated lower guide member having two lateral guide walls and a bottom, the improvement comprising pivotal means for swinging a lateral guide wall outwardly in the direction from the guide slot about a horizontal swivel axis with the height of the swung-out lateral guide wall measured from its highest point to the bottom of the lower guide member smaller than the distance between the bottom of the doors extending into the guide slot and the bottom of the lower guide member, the swinging guide wall being supported between lateral frame parts with each lateral frame part having, coaxially with the swivel axis, a pivot pin, and, associated with each end of the swinging guide wall, there is a vertically extending elongated hole into which the pivot pin protrudes and is in the upper end of the elongated hole when the swinging guide wall is in the normal not swung-out position; and latch means being provided to prevent the pivotal guide wall from being swung out sideways until it is raised far enough for the pivot pin to reach the lower end of the elongated hole.

4,228,561

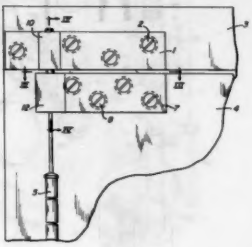
SHOCK PIVOT HINGE

Joseph W. Gwozdz, Clark Summit, Pa., assignor to McKinney Manufacturing Company, Scranton, Pa.

Filed Mar. 8, 1979, Ser. No. 18,509

Int. Cl.[2] E05D *7/00*

U.S. Cl. 16—131 **8 Claims**



1. The combination with a door supported in a door frame by conventional hinges having hinge pins spaced a predetermined distance from the door, and a stop limiting the distance the door can be opened, of a shock pivot hinge comprising an upper jamb leaf mounted on the door frame above said hinge pins, a door leaf mounted on the door between the jamb leaf and said conventional hinges, an end portion of said door leaf extending outwardly over said hinge pins and provided with a vertical opening above them, the jamb leaf being provided with an opening therein directly above said first-mentioned opening, blocks mounted in said openings, and a shock pivot pin extending vertically from one of said blocks toward the other block in axial alignment with the underlying hinge pins, said shock pivot pin being offset in the same direction relative to the centers of both blocks in a vertical plane perpendicular to the closed door, and said blocks being turnable 180° in said leaf openings to locate said shock pivot pin in axial alignment with underlying hinge pins spaced from the door a different predetermined distance than said first-mentioned predetermined distance.

4,228,562

BILATERAL SWINGABLE SELF-CLOSING DOOR HINGE

Yun T. Hsu, 30-27, Chun In Rd., Chun In Village, Tong Sun Hsiang, I Lan Hsien, Taiwan

Filed Sep. 25, 1978, Ser. No. 946,057

Int. Cl.[2] E05F *1/06*

U.S. Cl. 16—154 **5 Claims**

1. A bilateral swingable self-closing door hinge for mounting to a door having a door leaf and a door frame, comprising:

a first hinge part, said first hinge part including

a lower axle base having an upwardly extending center axle,

a first hinge leaf including means for securing said first hinge leaf to the door leaf in either an upright or upside down orientation, and means mounted to said lower axle base for removably rigidly mounting said lower axle base to said first hinge leaf with said center axle upright and said first hinge leaf secured to said door either upright or upside down,

a second hinge part, said second hinge part including

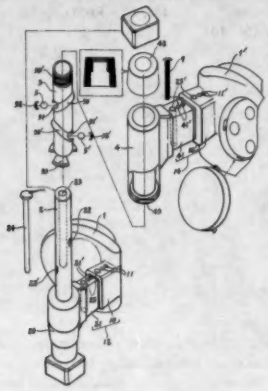
a socket part slidably and rotatably fitted onto said center axle,

a second hinge leaf including means for securing said first hinge leaf to the door frame, in either an upright or an upside down orientation, and

means mounted to said socket part for removably rigidly mounting said socket part to said second hinge leaf with said second hinge leaf either upright or upside down so that said door hinge may be mounted to either the left side of said door for counterclockwise opening or to the right

side of said door for clockwise opening with said center axle upright;

said second hinge part including means, associated with said



center axle and said socket part, for causing said first hinge leaf to rise when swung in one direction from a first position relative to said center axle and to rise when swung in the opposite direction from said first relative position.

4,228,563

DRIVE APPARATUS OF A CAN FOR DEPOSITING TEXTILE FIBRE SLIVERS

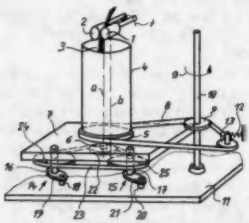
Kurt Weber, Elgg, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Feb. 26, 1979, Ser. No. 15,348

Claims priority, application Switzerland, Mar. 3, 1978, 2320/78

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—159 R **18 Claims**



1. In a drive apparatus for a can for depositing textile fibre slivers in spinning preparatory machines, in which the can effects a rotational movement about its axis, and in which the can axis in turn rotates about an axis substantially parallel to it which is fixed with respect to space, the improvement which comprises:

at least one can table for supporting and centering the can;

a plate for rotatably supporting and driving the can table;

means for driving said can table and the can supported thereby; and

said driving means including means for placing said plate into a translatory circular movement.

4,228,564

TOP ARMS FOR TEXTILE FIBRE ROLLER

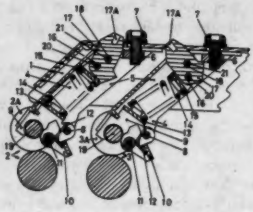
John M. Noguera, 1 Greville House, Kinnerton St., London S.W.1, England

Filed Mar. 7, 1978, Ser. No. 884,233

Claims priority, application United Kingdom, May 9, 1977, 19409/77

Int. Cl.² D01H *5/50*

U.S. Cl. 19—282 **7 Claims**



1. A top-roller weighting device for use with a textile fibre roller drafting mechanism top arm; the device comprising a body, a top-roller retainer guided by the body, spring means acting so as to apply pressure on the top-roller retainer, and a weight adjuster that moves between at least two rest positions to alter the angle of action of the spring means but not its length to thereby alter the effective weight applied to the top-roller by changing the direction of force of the spring from a substantially linear force to a force having components in two directions and in which the weight adjuster is pivotally connected to the body of the device.

4,228,565

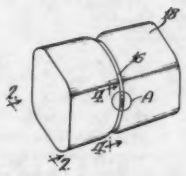
STRAP FOR FORMING A READILY DISENGAGEABLE ANTI-REVERSE SEALLESS STRAP CONNECTION

Peter Lems, Wilmette, and William A. Meier, Hoffman Estates, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Aug. 17, 1978, Ser. No. 934,497

Int. Cl.³ B65D *63/02*

U.S. Cl. 24—20 EE **11 Claims**



1. In a bale tie of the type comprising a generally flat metal strap adapted for forming a loop about compressible material and having a first joint-forming portion on one end and a second joint-forming portion on the other end, said joint-forming portions each containing an array of longitudinally spaced joint elements, said joint elements on one of said portions being adapted to interlock with the joint elements on the other portion for forming a sealless strap connection when the joint-forming portions are overlapped with said second joint-forming portion lying between said material and said first joint-forming portion, said strap further having an inner side adapted to lie against said material and an outer side opposite the inner side, the improvement comprising:

an abutment depending from said outer side of said strap on said second joint-forming portion and a disengageable anti-reverse bale tie engaging means on said first joint-forming portion for aligning with said abutment on said second joint-forming portion when said strap is formed

into a loop and when said sealless connection is formed between said joint-forming portions, said abutment being located on said second joint-forming portion outwardly of and adjacent the array of all of the longitudinally spaced joint elements, said engaging means located at said inner side of said strap inwardly of and adjacent the array of all of the longitudinally spaced joint elements for aligning with said abutment on said second joint-forming portion when the connected strap loop is placed about said material and is outwardly bowed to force said abutment against the inner side of said first portion and adjacent said engaging means whereby, when the joint-forming portions are moved relative to each other in a disengaging direction, said abutment bears against said engaging means and disengagement of the connection is prevented, said connection being easily disengaged, however, by orienting said overlapped and connected joint-forming portions of said strap in a generally inwardly bowed configuration and then displacing one of said portions longitudinally relative to the other portion in the disengaging direction.

4,228,566

SLIDE FASTENER STRINGER

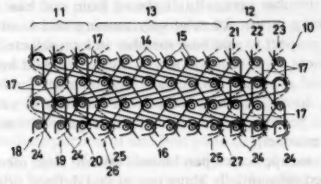
Yoshio Matsuda, Toyama, Japan, assignor to Yoshida Kogyo KK, Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 972,699

Claims priority, application Japan, Dec. 29, 1977, 52-176719[U]

Int. Cl.[2] A44B *19/00*

U.S. Cl. 24—205.16 C **7 Claims**



1. A slide fastener stringer comprising:

(a) a warp-knit stringer tape having a pair of spaced edge portions and a central portion extending between said edge portions, said stringer tape comprising:

(1) a first set of yarns forming a first knit ground structure containing stitch loops in every course and wale of said tape;

(2) a second set of yarns knit in said first ground structure and each extending coursewise across at least one wale, said yarns of the second set comprising textured yarns and forming a second knit ground structure containing stitch loops in every wale of the tape other than said one wale, said central portion consisting of said first set of yarns and said second set of yarns;

(3) a third set of yarns forming a plurality of chains of loops knit in said first and second ground structures and extending along wales in at least one of said edge portions; and

(4) a fourth set of yarns laid in said first and second ground structures and extending in and along said last-named wales; and

(b) a row of coupling elements mounted on and along said one of the edge portions of the tape.

4,228,567

BUCKLE ASSEMBLY FOR SEAT BELT

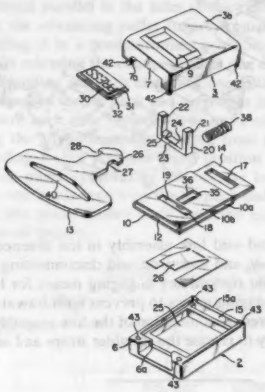
Haruyuki Ikesue, Fujisawa, and Kazuo Yamamoto, Sagamihara, both of Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,164

Claims priority, application Japan, Sep. 20, 1977, 52-126632[U]

Int. Cl.[2] A44B *11/26*

U.S. Cl. 24—230 AL **5 Claims**



1. A buckle assembly for a vehicle seat belt comprising first and second opposing cover members defining a tongue insertion opening and a chamber therebetween communicating with the tongue insertion opening, a base member disposed within the chamber, the base member folded into a substantially U-shape to provide a pair of parallel plates defining a tongue guide path therebetween contiguous with the tongue insertion opening and extending in a tongue insertion direction, the fold connecting the parallel plates extending parallel to the tongue insertion direction, a portion of the parallel plates opposite to the tongue insertion opening being overlapped and in contact to provide a connecting portion adapted for connecting the buckle assembly to a vehicle body, the parallel plates having opposing guide slots extending transversely to the tongue insertion direction, a latch member slidably disposed within the guide slots, the latch member having a contacting portion for contacting a tongue inserted into the tongue guide path and for causing the latch member to slide to a non-locking position, the latch member having a restraining portion engageable with the tongue for locking the tongue, biasing means within the chamber for biasing the latch means toward a tongue locking position, and a push button for operating the latch member to move it to a non-locking position, the biasing means, latch member, and base member being serially disposed, in order, within the second cover member and the push button being disposed within the first cover member.

4,228,568

RELEASABLE FASTENER FOR AIRCRAFT EJECTION SEATS

Richard H. Frost, Littleton, and Charles W. Dodge, Golden, both of Colo., assignors to Frost Engineering Development Corp., Englewood, Colo.

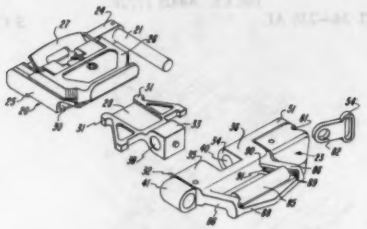
Filed Nov. 13, 1978, Ser. No. 959,769

Int. Cl.[2] A44B *19/00*

U.S. Cl. 24—230 R **13 Claims**

6. A releasable fastener for use with an aircraft ejection seat for releasably joining lap belts, shoulder straps and a key connected to a parachute ripcord, comprising, in combination, a manually actuable release assembly secured to one lap belt and having means thereon for receiving looped ends of shoulder straps, a link assembly secured to another lap belt and engagea-

ble with said release assembly for coupling said lap belts and shoulder straps, means on said link assembly for powerably disconnecting the link assembly to release said shoulder straps and separate said lap belts, means on said link assembly for releasably engaging said ripcord key, said ripcord key engaging means including means for precluding the coupling of said



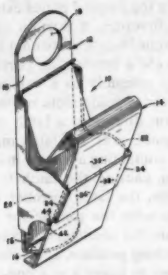
release assembly and said link assembly in the absence of an engaged ripcord key, and means on said disconnecting means engageable with said ripcord key engaging means for locking said ripcord key engaging means to prevent withdrawal of said key upon the powered disconnection of the link assembly from the release assembly to release the shoulder straps and separate the lap belts.

4,228,569

IDENTIFICATION BADGE CLIP

George R. Snyder, Woodbridge, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Jan. 11, 1979, Ser. No. 2,666
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—252 R **3 Claims**



1. An identification badge clip comprising:

(a) a hardened sheet metal base member including a flat strip having a first jaw bent up substantially at right angles at one end and a pair of aligned arms extending up from opposite sides of the strip, and being formed with aligned notches spaced up from the strip, the distal ends of the arms each being bent at a point spaced outward of the strip from the notches and extending inward in flanges toward each other, and

(b) a Z-shaped member of resilient metal strip disposed within the embrace of said arms to hold the base member and strip together as an assembly and including an inner end run, an intermediate run and an outer end run engaging the flanges, the outer end run having a second jaw at its free end bent down substantially at right angles and aligned with the first jaw, the inner end run contacting the base member, the Z-shaped member being biased to close the jaws, the outer end run being enlarged between the second jaw and the engagement of the lastmentioned run with the arms and the enlargement presenting shoulders which engage the arms in the notches,

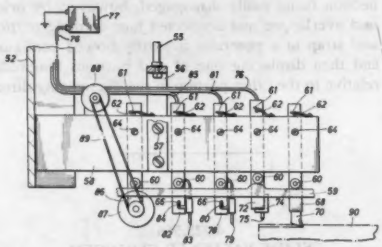
whereby the notches present an outward-facing fulcrum so that downward pressure on the outer end run adjacent its non-free end opens the jaws.

4,228,570

ELECTRODING PREPARATION APPARATUS

Rhodes R. Chamberlin, and Herbert L. Bigham, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Continuation of Ser. No. 847,784, Nov. 2, 1977, abandoned. This application Oct. 15, 1979, Ser. No. 84,571
Int. Cl.[3] B23P *23/04, 25/00*
U.S. Cl. 29—33 R **8 Claims**



1. Apparatus for operating on a vitreous substrate having a plurality of contiguous component layers of a photovoltaic cell, comprising:

a base member;

holding means located on said base member and adapted to define edge positions of said substrate on said base member;

a head member vertically displaced from said base member;

positioning means for relatively moving said head member with respect to said base member in a preselected pattern;

component layer removal means located on said head member and directed toward said base member for forming a track having defined sides while moving in said preselected pattern within said defined edge positions on said base member;

at least one applicator pen located on said head member and aligned substantially along one of said defined sides of said track of said component layer removal means for depositing a strip of insulating material therealong; and

an actuating system responsive to the location of said head member relative to said defined edge positions on said base member for selectively actuating said component layer removal means and said at least one applicator pen as said removal means and said pen cross at least one of said defined edge positions.

4,228,571

HYDRAULIC SUPPORT ELEMENT

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Nov. 16, 1978, Ser. No. 961,241
Claims priority, application Switzerland, Dec. 20, 1977, 15715/77
Int. Cl.[2] B21B *21/02*
U.S. Cl. 29—116 AD **25 Claims**

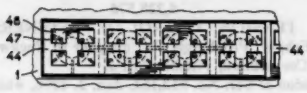
1. A hydraulic support element for mounting a movable part upon a stationary support, comprising:

an elongate support ledge having a bearing surface for slidingly supporting the movable part;

said elongate support ledge together with said support or a part arranged at the support delimiting a hydraulic pressure chamber for a hydraulic medium which is under

pressure and by means of which the support element is supported at the support;

said elongate support ledge having an extended dimension sufficient for coacting with at least two hydrostatic support arrangements;



at least two hydrostaic support arrangements having substantially cylindrical guide surfaces for supporting the elongate support ledge at the support; and

said two hydrostatic support arrangements being dispositioned adjacent one another in the lengthwise direction of the elongate support ledge and containing substantially piston-like parts.

4,228,572

HEAT EXCHANGER ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 880,991, Feb. 24, 1978, Pat. No. 4,181,173. This application Jun. 4, 1979, Ser. No. 44,855

Int. Cl.[3] **F28F** *3/12;* **F25B** *39/02;* **B23P** *15/26*

U.S. Cl. 29—157.3 R **1 Claim**

1. A method of making a heat exchanger assembly comprising the steps of; forming at least two horizontally spaced embossments in a first plate member and having one end of each of said embossments terminating to define a flat intermediate portion of said first plate member between each of said horizontally spaced embossments, forming at least one embossment in a second plate member, mating and fastening said plate members together to define channel passages wherein each of said embossments in said second plate member extend over said flat intermediate portion of said first plate member and overlap a portion of each of said horizontally spaced embossments whereby the latter are interconnected, and bending said plate members at said flat intermediate portion to define a corner whereby one of said first-mentioned embossments are on each side of said corner and are interconnected by said second-mentioned embossments extending about the outside of said corner.

4,228,573

METHOD FOR ASSEMBLING HEAT EXCHANGERS

James A. Barnard, Olcott, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 29, 1979, Ser. No. 53,361

Int. Cl.[3] **B23P** *15/26*

U.S. Cl. 29—157.3 R **1 Claim**

1. A method of assembling a heat exchanger comprised of perforated fins, a pair of perforated headers and a plurality or reverse bent tubes as the fins are being stamped from sheet stock, said method comprising:

accumulating the fins in face-to-face relationship and in stacks following their stamping,

sequentially feeding the stacks of fins onto a stationary path with their faces vertical to the path and transverse to the sides thereof whereby a column of fins in face-to-face relationship is formed and advanced along the path as stacks of fins following stamping continue to be fed thereto,

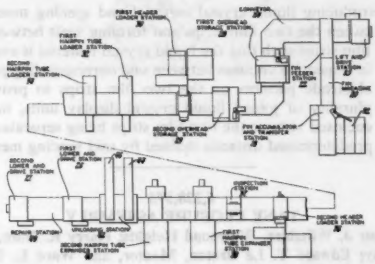
lifting a pallet fixture from an endless continuously moving conveyor and holding it in a predetermined position overhead thereof,

separating a complete pack of fins for a heat exchanger from the head of the column in the time interval between an advancement and feeding the pack of fins onto the pallet fixture,

clamping the pack of fins at opposite ends thereof to the pallet fixture and then lowering the pallet fixture onto the conveyor to be advanced thereby with the faces of the fins oriented parallel to the sides of the conveyor,

lifting the advancing pallet fixture from the conveyor and holding it in a predetermined position overhead thereof while releasing the clamping from one end of the fin pack and guiding and then clamping one of the headers against this end of the fin pack and thereafter lowering the pallet fixture back onto the conveyor to be advanced thereby,

lifting the advancing pallet fixture from the conveyor and holding it in a predetermined position overhead thereof while guidably inserting the reverse bent tubes through the one header and then the fin pack and thereafter lowering the pallet fixture back onto the conveyor to be advanced thereby,



lifting the advancing pallet fixture from the conveyor and holding it in a predetermined position overhead thereof while releasing the clamping from the opposite end of the fin pack and guiding the other header onto the tubes and then forcing same against this end of the fin pack and thereafter clamping this header against this end of the fin pack and then lowering the pallet fixtue back onto the conveyor to be advanced thereby,

lifting the advancing pallet fixture from the conveyor and holding it in a predetermined position overhead thereof while radially expanding the tubes to tightly engage both the fins and the headers and thereafter lowering the pallet fixture back onto the conveyor to be advanced thereby, and

lifting the advancing pallet fixture from the conveyor and holding it in a predetermined position overhead thereof while unloading the thus assembled fin pack, headers and tubes therefrom and thereafter lowering the empty pallet fixture back onto the conveyor for its conveyance thereby to repeat another assembly of a heat exchanger thereon according to the above steps.

4,228,574

AUTOMATED LIQUID CRYSTAL DISPLAY PROCESS

Bobby G. Culley, Wylie, and Kishin Surtani, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1979, Ser. No. 43,068

Int. Cl.[3] **H01J** *9/26*

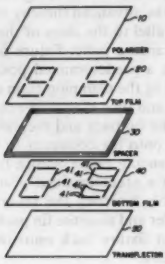
U.S. Cl. 29—25.13 **13 Claims**

1. A liquid crystal display unit fabrication process comprising:

forming conductive electrode patterns on surfaces of respective first and second elongated strips of flexible transparent insulating film;

forming an alignment layer on each of the patterned surfaces of the first and second film strips;

bringing the film strips adjacent each other with the electrode patterns on the two strips facing each other such that the respective electrode patterns on one strip are positioned opposite corresponding electrode patterns on the other strip, to define pairs of corresponding electrode patterns;



introducing liquid crystal material and spacing means between the two film strips and forming seals between the film strips such that the liquid crystal material is enclosed in respective volumes between said corresponding pairs of electrode patterns on the two film strips to provide a plurality of joined liquid crystal display units, in each enclosed volume the two film strips being separated by a predetermined distance defined by said spacing means.

4,228,575

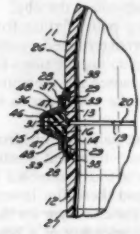
TANK CLOSURE ASSEMBLY

Arthur J. Wiltshire, Richmond Heights; Harry R. Nara, Novelty; Edward T. Le Breton, Mentor, and Ward L. Bliley, Chesterland, all of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Division of Ser. No. 754,830, Dec. 27, 1976, Pat. No. 4,133,422. This application Nov. 27, 1978, Ser. No. 963,796

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—407 **2 Claims**



1. A method of making a split tank assembly comprising the steps of providing an integrally molded tank of circular cross section and having substantially closed ends, severing the tank into two sections by developing rotational movement between a cutting station and the tank about a central tank axis, providing cutting means for simultaneously forming axially spaced grooves and an intermediate cut-off plane, with the elements forming said grooves and cut-off plane all with a fixed axial separation relative to each other, during said relative rotational movement engaging the outer surface of the tank with said cutting means to thereby form said space grooves and intermediate cut-off planes, inserting circumferentially split flanges into the grooves of a pair of sections, positioning said sections in fact-to-face relation, disposing a gasket between said flanges, and drawing said flanges into tight engagement with said gasket by positioning and circumferentially tightening a band around said flanges to draw them together by means of working surfaces integral with said band.

4,228,576

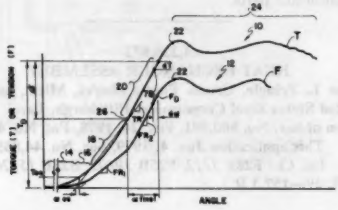
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,365

Int. Cl.[2] B25B *23/14;* **G01L** *5/24*

U.S. Cl. 29—407 **6 Claims**



1. A method of tightening a threaded fastener with a tool of the type including means for energizing and deenergizing the tool for starting and stopping tightening wherein the tool exhibits overrun after deenergization, comprising

applying torque to the fastener for threadably advancing the same;

sensing applied torque and the angle of threading advance;

deenergizing the tool at a location where the fastener is stressed;

determining a first torque rate of the fastener over an angle increment including at least part of the overrun of the tool;

comparing the first torque rate with a second torque rate; and

generating a signal in response to the comparison of the first and second torque rates.

4,228,577

METHOD OF MAKING ROTARY TYPE WHEELS

Takami Suzuki; Nobuo Iwata, and Masami Tsunasawa, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 722,243, Sep. 10, 1976, Pat. No. 4,126,400. This application Sep. 6, 1978, Ser. No. 939,948

Claims priority, application Japan, Sep. 12, 1975, 50-109978

Int. Cl.[3] B23P *17/00*

U.S. Cl. 29—418 **3 Claims**

3. A method of making a rotary type wheel comprising the steps of:

(a) forming an integral molding comprising an annular portion and a plurality of equiangularly disposed supports each extending radially inwardly from the radially inner periphery of the annular portion, each support incorporating at least one type face accurately positioned with respect to the center of the annular portion;

(b) positioning the integral molding in a mold;

(c) molding in said mold a hub and radially outwardly directed tongues corresponding in number and angular

disposition to the plurality of supports, each of said tongues being molded about a corresponding support such

that each support is thereby fixedly secured to each tongue; and

(d) disconnecting the annular portion from the support.

4,228,578

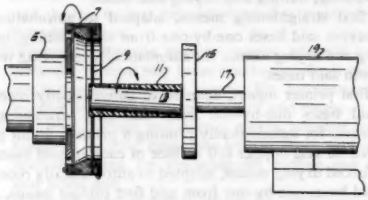
METHOD FOR OFF-ORIENTATION POINT ROTATION SAWING OF CRYSTALLINE ROD MATERIAL

Lawrence Y. Lin; Henry W. Gutsche, and James A. Collier, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 15, 1979, Ser. No. 3,563

Int. Cl.[2] B23P *17/00*; H01L *7/66*; B25B *1/00*

U.S. Cl. 29—423 **18 Claims**



1. A method for point rotation sawing of crystalline rod material at off-orientation angles comprising:

determining the off-orientation angle of the rod crystallographic axis;

encapsulating the rod in a molding media forming a cylindrical geometric encapsulation containing the rod with its crystallographic axis at an angle to the cylindrical axis of the encapsulation, the angle being substantially equal to the predetermined off-orientation angle;

rotating the cylinder about its axis;

contacting the rotating cylinder with a sawing means at one or more points tangent to the cylinder surface and perpendicular to the cylinder's axis of rotation;

positioning the sawing means and the cylinder in constant rotating point contact; and

sawing a thin wafer from the cylinder which is inclusive of an off-orientation crystalline material wafer.

4,228,579

METHOD AND APPARATUS FOR WINDING A STRIP OF FILM AND FOR INSERTING IT IN A CASSETTE

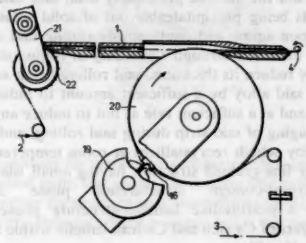
Franz-Heinz Dunkel, Leverkusen; Ralf L. Klinkhammer, Cologne; Heinz Nebel, Leverkusen; Siegfried Spanner, Langenfeld, and Gerd Seibel, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

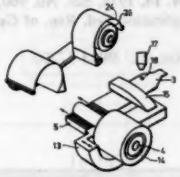
Filed Feb. 27, 1979, Ser. No. 15,800

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809360

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—430 **7 Claims**





2. An apparatus for cutting a strip of film and a light protective paper tape to length, winding them and inserting them into a cassette, in which the strip of film together with the protective tape which is offset in the longitudinal direction, is cut to length on distribution wheels, and after being fed via a guide means to a spindle, is wound and inserted into a cassette which is open at the side comprising distribution wheels for the strip of film and the protective paper tape, a spindle, a feed duct for conducting a strip of film and protective paper tape to the spindle, the feed duct is arranged downstream of the spindle, slits on the spindle which can be connected selectively to a vacuum line or compressed air line, the spindle is connected via an annular spring coupling to a spindle drive mechanism, the spindle is provided with a brake, a pusher plate is provided adjacent the spindle, and the pusher plate having a clamp for gripping the end of the protective paper tape.

7. A method as set forth in claim 1, wherein a leading end of the paper tape is shaped to fit the outside of the spindle before it is moved into contact therewith.

4,228,580

PROCESS FOR MAKING WROUGHT, LEAD-CALCIUM BATTERY GRID ALLOY HAVING HIGH TEMPERATURE TENSILE STRENGTH STABILITY

Robert C. Matter, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 886,078, Mar. 13, 1978, abandoned. This application Sep. 11, 1978, Ser. No. 940,993

Int. Cl.[3] C22F 1/12; C22C 11/02

U.S. Cl. 29—527.7 4 Claims

1. A process for making wrought, lead-calcium, automotive, battery grids comprising the steps of: casting a substantially continuous strip of alloy consisting essentially of about 0.07% to about 0.11% by weight calcium, less than about 1.5% by weight tin and the balance principally lead, said calcium and tin alloyants being precipitateable out of solid solution with said lead upon aging; and continuously rolling said strip rapidly in one direction through a plurality of rolling stations to significantly reduce its thickness, said rolling being such as to cold work said alloy by a sufficient amount to induce strain hardening, and at a sufficient rate as not to induce any significant strain aging of said strip during said rolling, and so as to yield an alloy which recrystallizes at room temperature to a substantially fine-grained structure having small islands of a uniform-alloyant-content structureless phase dispersed throughout a pearlite-like lamellar-structure phase having alternate layers of Ca-rich and Ca-lean lamella within about 30 days after said rolling.

4,228,581

METHOD FOR PRODUCING SEMICONDUCTOR BODIES HAVING A DEFINED EDGE PROFILE WHICH HAS BEEN OBTAINED BY ETCHING AND IS COVERED WITH A GLASS

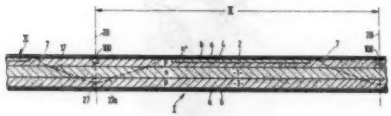
Madan M. Chadda, Nürnberg-Gaulnhofen, and Reinhold Maier, Nuremberg, both of Fed. Rep. of Germany, assignors to SEMIKRON Gesellschaft für Gleichrichterbau und Elektronik m.b.H., Nuremberg, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,649

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751485

Int. Cl.[2] B01J 17/00

U.S. Cl. 29—578 7 Claims



1. In a method for producing semiconductor bodies having a glass-covered defined edge profile, said semiconductor bodies being obtained by etching from a large-area semiconductor basic wafer having a sequence of layer-type zones of different conductivity type with at least one pn-junction and a surface oxide layer thereon, the steps comprising

applying an etch-resistant protective coating onto said surface oxide layer,

cutting groove-shaped recesses in said semiconductor wafer in a predetermined pattern which extend through said protective coating and said surface oxide layer to the surface of said semiconductor wafer for subdividing said wafer into said semiconductor bodies or smaller areal expanse,

etching said semiconductor wafer through said recesses to produce each a deep portion therein which passes through at least one pn-junction of said wafer, the side faces of said deep portion being shaped to form a predetermined edge profile of adjacent semiconductor bodies,

removing said surface oxide layer and etch-resistant coating from said wafer having deep portions, applying an insulating and stabilizing glass coating onto the side faces of said deep portions,

cleaning the surface of said semiconductor wafer and applying a contact metal coating thereof,

dividing said wafer into semiconductor bodies along the center planes of selected deep portions of said wafer, and

covering the surface of said semiconductor bodies with an insulating lacquer at those portions which have been exposed by said dividing step.

4,228,582

AUTOMATIC PRODUCTION SYSTEM FOR PRINTED-WIRING BOARDS

Minoru Arai, Tokyo, Japan, assignor to Tokyo Print Industry Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1978, Ser. No. 946,061

Int. Cl.[3] H05K 3/00

U.S. Cl. 29—650 12 Claims

1. An automatic production system for producing printed wiring boards in which previously drilled and contoured bases having rear surfaces and copper foil front surfaces are subjected to continuous and automatic opeations, said system comprising:

a series of successive production elements arranged to operate on said bases in a successive order to produce said wiring boards;

transfer means for automatically transferring said bases between each of said successive production elements;

said successive production elements including:

(1) means for retaining a stack of said bases and automatically delivering said bases one-by-one onto said transfer means;

(2) means, adapted to automatically receive said bases one-by-one from said transfer means, for automatically washing, buffing and drying said bases;

(3) first straightening means, adapted to automatically receive said bases one-by-one from said washing, buffing and drying means, for automatically removing warp from said bases;

(4) first printer means, adapted to automatically receive said bases one-by-one from said first straightening means, for automatically printing a printed circuit pattern on said copper foil surface of each of said bases;

(5) forced drying means, adapted to automatically receive said bases one-by-one from said first printer means, for automatically forced-drying said printed circuit pattern onto said copper foil surface of each of said bases;

(6) etching means, adapted to automatically receive one-by-one said bases from said forced drying means, for automatically removing copper foil which is not beneath said printed circuit pattern from said copper foil surface to form electrical circuits on each of said bases;

(7) washing means, adapted to automatically receive one-by-one said bases from said etching means, for automatically washing said printed circuit pattern from said bases;

(8) second straightening means, adapted to automatically receive said bases one-by-one from said washing means, for automatically removing warp from said bases;

(9) first selection means, adapted to automatically receive said bases one-by-one from said second straightening means, for automatically detecting defective electronic circuits among the electrical circuits on each of said

bases and stacking the ones of said bases having defective electrical circuitry;

(10) first buffing and drying means, adapted to automatically receive from said first detecting and stocking means, those of said bases not detected as having defective electrical circuitry in said first detecting and stacking means for buffing and drying those of said bases received from said first detecting and stacking means;

(11) second printing means, adapted to automatically receive said bases one-by-one from said first buffing and drying means for automatically printing resistance material on said printed electrical circuitry;

(12) first cooling and hardening means, adapted to automatically receive said bases one-by-one from said second printing means, for cooling and hardening said resistance printing on said bases;

(13) third straightening means, adapted to automatically receive said bases one-by-one from said first cooling and hardening means, for automatically removing warp from said bases; and

(14) third printing means, adapted to automatically receive said bases one-by-one from said third straightening means, for automatically printing first indicia, corresponding to the electrical characteristics of said resistance printing such as a service map on said base;

(15) second cooling means, adapted to automatically receive one-by-one said bases from said third printing means, for cooling said bases;

(16) fourth straightening means, adapted to automatically receive said bases one-by-one from said second cooling and for automatically removing warp from said bases;

(17) first reverser means, adapted to automatically receive said bases one-by-one from said fourth straightening means, for automatically reversing the front and rear faces of said bases;

(18) fourth automatic printing means, adapted to automatically receive said bases one-by-one from said first reverser means, for printing on said rear face of said bases, second printed indicia corresponding to a load map for said electrical circuit;

(19) second drying means, adapted to automatically receive said bases one-by-one from said fourth printing means, for drying said rear face of said bases;

(20) fifth automatic straightening means, adapted to automatically receive said bases one-by-one from said second drying means, for automatically removing warp from said bases;

(21) second automatic reverser means, adapted to automatically receive said bases one-by-one from said fifth automatic straightening means, for automatically reversing the front and rear faces of said bases;

(22) second buffing and drying means, adapted to automatically receive bases one-by-one from said second reverser means, for automatically buffing and drying said bases; and

(23) fluxing finisher means, adapted to automatically receive said bases one-by-one from said second buffing and drying means, for automatically fluxing said bases to form completed printed wiring boards.

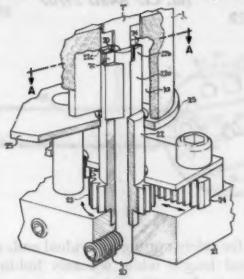
4,228,583

SCREW SOCKET ASSEMBLY DEVICE

Stanley J. Noesen, Hendersonville, and Fredrick M. Baldwin, Asheville, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,571
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—747 **6 Claims**

1. Apparatus for securing a screw-shell to a lamp socket housing, wherein the screw-shell has a terminal strip extending through a slot in the housing into a confined space between the slot and the open bottom of the socket housing, the terminal strip being formed at its free end with a terminal tab and a pair of oppositely projecting ears spaced axially away from the terminal tab, said apparatus comprising a fixed mandrel having a slot at its end for receiving the terminal tab, and a tubular mandrel surrounding and rotatable about said fixed mandrel, said tubular mandrel formed at its end with a pair of radially



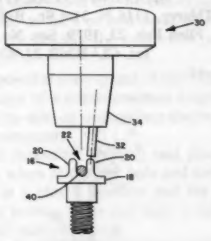
spaced projections for respectively engaging the opposite ears of the terminal strip, and means for turning said tubular mandrel for bending the opposite ears about 90° to the plane of the terminal strip while said fixed mandrel holds the terminal tab stationary.

4,228,584

METHOD OF ELECTRICAL CONNECTOR

C. David Sherrod, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 863,481, Dec. 22, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,947
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—863 **2 Claims**



1. A method of securing a wire to a head of an electrical connector, the head including a base and a pair of spaced members extending upwards from the base, the method including the steps of:

placing the wire in a groove defined by the base and the upwardly extending members;

applying a plurality of hammering forces directly to the upwardly extending members, the direction of the hammering forces forming an acute angle with a vertical plane generally bisecting the groove for deforming the upwardly extending members to substantially cover the wire in the groove; and

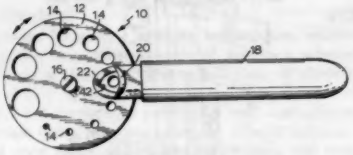
moving the direction of the hammering forces around the upwardly extending members while maintaining an acute angle between the direction of the hammering forces and the vertical plane generally bisecting the groove to apply a plurality of hammering blows spaced around the periphery of the upwardly extending members to force material over the wire.

4,228,585

ANIMAL NAIL CLIPPER

Wilbur C. Nelson, 2754 NE. 31st Ct., Lighthouse Point, Fla. 33064

Filed Jan. 29, 1979, Ser. No. 7,020
Int. Cl.³ A45D *29/02*
U.S. Cl. 30—29 **1 Claim**



1. A device for safely cutting individual nails of an animal to a predetermined length while securely holding the nail in position relative to the cutting blade, comprising:

a cutting blade;

a means for mounting said cutting blade, said mounting means having an aperture disposed therethrough;

mechanical actuating means for reciprocally moving said blade from a first position to a second position past said mounting aperture connected to said cutting blade and said mounting means; and

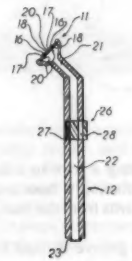
a nail holding plate connected to said actuating means, said plate including at least two apertures, said apertures being of different diameters each aperture diameter sized to allow receipt of a portion of an animal nail to a predetermined length, said plate being movable to coaxially position one of said apertures relative to said blade mounting aperture, whereby an aperture may be selected to receive an animal nail to provide penetration to a predetermined length of said nail.

4,228,586

SHAVING APPARATUS

Timothy T. Thierry, 1116 N. 31st St., Billings, Mont. 59101

Filed Feb. 23, 1979, Ser. No. 14,370
Int. Cl.³ B26B *21/40*
U.S. Cl. 30—41 **10 Claims**



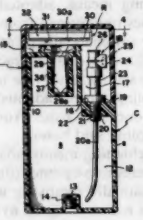
1. Shaving apparatus including a shaver head portion, a handle portion and a liquid conveying portion, said shaver head portion including a substantially planer face, an orifice in said shaver head face, at least one razor blade disposed adjacent to said face central of said orifice with the sharpened edge thereof extending outwardly therefrom, said orifice being significantly larger than the width of said blade to provide open areas on both sides of said blade, a passage extending through said shaver head portion from said orifice, said handle portion including a conduit extending along the length thereof with one end communicating with said passage through said shaver head portion and the other end of said conduit within said handle portion which is remote from said shaver head portion being connected to one end of said liquid conveying portion, the opposite end of said liquid conveying portion being adapted for attachment to a source of water under pressure, and said handle portion including valve means for controlling the flow of water from said water source through said liquid conveying portion, said conduit of said handle portion, said shaver head passage and out said orifice of said shaver head face.

4,228,587

COMBINED RAZOR HOLDER AND SHAVING FLUID DISPENSER

Charles H. Bennett, 8320 Russell St., Utica, Mich. 48087

Filed May 2, 1979, Ser. No. 35,252
Int. Cl.³ B26B *21/44*
U.S. Cl. 30—41 **10 Claims**



1. In a compact, portable, pocket size, shaving product; a reusable container having a chamber for holding a shaving lotion and configured to be gripped by the hand of a shaver; said container having an open ended vertical well of predetermined length in the upper end of the container, separated from said chamber; and open to the top wall of the container at its upper end; a device for dispensing lather from said container; a disposable safety razor comprising a stem with an overhanging head having an exposed blade; the stem being of a cross-sectional size and shape to be received in said well; releasable means cooperating between said well and stem for releasably holding said stem in a lowermost position in which the razor head is adjacent the top wall of the container in stored position; and in a raised position extended from said well substantially, in which the head is in shaving position; the said releasable means permitting withdrawal of the stem from the well entirely to permit the replacement of one razor with another; and a removable container cap for the upper end of the container and the exposed safety razor head.

4,228,588

GRADE CHECKER

Lloyd E. Horton, Jr., New Milford, Pa. 18834

Filed Nov. 17, 1978, Ser. No. 961,647
Int. Cl.³ G01C *15/00*
U.S. Cl. 33—1 H **1 Claim**

1. A grade checker instrument comprising;

a vertically adjustable rod having a level and a scale thereon,

a ground supported hollow shaft having a foot support attached thereto completely telescopingly enclosing and protecting said rod when in closed position and partially enclosing and protecting said rod when in extended position,

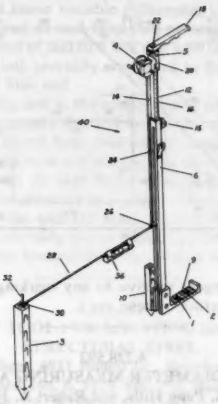
a line guide attached to said rod,

a handle means mounted on the top of said rod,

a line reel having line thereon connected to the upper portion of said rod,

the free end of said line having a loop formed thereon and

being passed vertically downwardly through said line guide, then turned horizontally and passed through a line



level and adapted to be attached temporarily to a grade stake for indicating grade level.

4,228,589

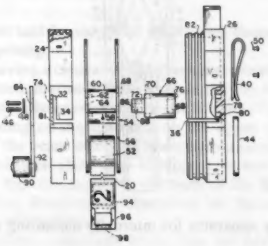
TAPEMEASURE FOR UNDERWATER USE

Theodore L. Chemay, 3132 Birch La., Marrero, La. 70072

Filed Jul. 18, 1979, Ser. No. 58,390

Int. Cl.³ G01B *3/10*

U.S. Cl. 33—138 **12 Claims**



1. In a measuring tape assembly with an extensible and retractable tape mounted on a spool in a case divided transverse to the spool axis into two parts and having a peripheral portion around the spool with structure defining an opening for passage of the tape, and means for winding the spool, the improvement comprising: the two case parts including a front and a back with integral means detachably joining the front and back, the detachably-joining means including the front and back each having a respective screw thread around said peripheral portion, and said structure defining the tape opening in the form of an "L" shaped slot with a horizontal portion extending across said front and back for holding the width of the tape partly in said front and partly in said back and with a vertical portion in said front for receiving the tape width vertically therealong for clearing the tape from said back and permitting said front and back to be rotated relative to each other on said screw threads for assembly and disassembly of said measuring tape assembly.

4,228,590

LEVELING POLE

Shinhichi Kimura, 2-11, Kita, 4-chome, Imazu, Tsurumi-ku, Osaka, Japan

Filed Mar. 16, 1979, Ser. No. 20,988

Int. Cl.³ G01B *3/10, 3/08;* G01C *15/00*

U.S. Cl. 33—138 **3 Claims**

1. A portable measuring pole comprising

(A) a circular cylindrical hollow outer pole having a first diameter, a top end, a bottom end, and having an opening in the vertical wall thereof toward said top end;

(B) a first roller means positioned within said outer pole toward said bottom end thereof;

(C) a plurality of circular cylindrical hollow inner poles having diameters successively smaller than said first diameter and positioned to telescope within each other and within said outer pole, said inner poles having top ends and bottom ends;

(D) a non-skid ring disposed at the top end of said outer pole and at the top end of each of said inner poles except the innermost pole, for holding the next inner pole at an extended position;

(E) end means disposed at the top end of said innermost pole;

(F) a flat plastic tape of a predetermined length and width and having side by side on one surface thereof two sets of calibrated measurements;

(G) spring wound means for holding said plastic tape in a wound position when said outer pole and said inner poles are telescoped in a closed position and for enabling the tape to be under tension when said tape is rolled out upon extension of said innermost pole;

(H) casing means of substantially circular cylindrical shape and having the diameter portion as an end portion for tightly and detachably fitting to said outer pole with the end portion thereof fitting into said opening of said vertical wall of said outer pole with the axis of said casing disposed transverse to the axis of said outer pole, said casing means comprising means for holding said spring means and said plastic tape therein, second roller means disposed within said casing, and guide means disposed on said casing to be positioned within said outer pole when said casing is attached to said outer pole at said opening in said outer pole, said casing also having an aperture at the top of the cylindrical wall of said casing, transparent means for covering said aperture, and movable opaque means disposed in said aperture for blocking substantially one half of the width of said tape thereby to enable reading through said transparent means of one set or the other set of calibrated measurements; whereby said tape is treaded along said second roller means within said casing, then outside of said casing and within said guide means, and then down through the inside of said outer pole and

then around said first roller means located at the bottom end of said outer pole, and then attached to one end of said innermost pole; and wherein said inner poles are extendable by manual means to a desired length with said nonskid rings holding by friction the inner poles next adjacent in the extended position; and whereby said tape is wound out to correspond to the point to point measurement, at said aperature of said casing, of the measurement from the bottom end of said outer pole to the top end of said innermost pole.

4,228,591

MEASUREMENT SENSING DEVICES

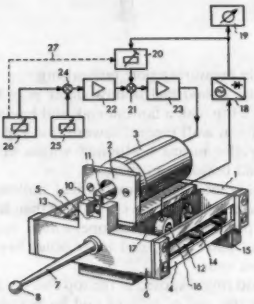
Armin Sterki, Thalwil, and Gerd Sommer, Dietikon, both of Switzerland, assignors to Maag Gear Wheel & Machine Co. Ltd., Zurich, Switzerland

Continuation of Ser. No. 765,191, Feb. 3, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 12,724

Claims priority, application Switzerland, Feb. 12, 1976, 1742/76

Int. Cl.³ G01B *7/28, 7/34*

U.S. Cl. 33—174 L **11 Claims**



1. A device for length or position measurements comprising a sensor element, a mounting for movably supporting said element means coupled to said mounting for sensing the displacement of said element, an electric motor coupled to said mounting for operating on said element to control the bearing pressure of said sensor element on an object to be measured, control means acting on said motor for arresting the motor at a predetermined position of the sensor while causing the motor to develop a torque that is operative on the sensor for said bearing pressure control, said electric motor operating on the element for maintaining continuous displacement of said sensor of the element with the object in response to the contact sensed by the sensing means after contact of the element with the object has been established.

4,228,592

MEASURING TOOL ESPECIALLY FOR CARPENTERS

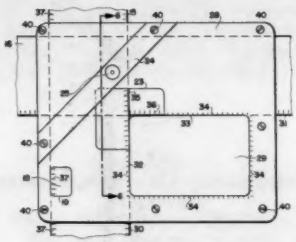
Harold J. Badger, R.F.D. 2, Box 71, Dover Foxcroft, Me. 04426

Filed Jun. 14, 1979, Ser. No. 48,484

Int. Cl.³ G01B *5/14, 3/02;* **B25H** *7/00*

U.S. Cl. 33—174 G **10 Claims**

1. A runner for a T-square, comprising guide channel means for the T-square, readout window means in said runner for reading a scale on said T-square, and aperture means extending through said runner, said aperture means being located in said runner so as to form marking template means, said aperture means being bounded by straight edges, said guide channel means having longitudinal channel defining walls at least one of which coincides with one of said straight edges bounding said aperture means, whereby said at least one channel defining



wall forms a tangent relative to any marking made directly through said aperture means.

4,228,593

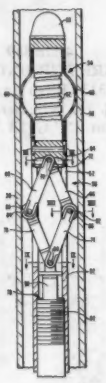
INTERNAL DIAMETER MEASURING APPARATUS

Joseph M. Frank, Penn Hills, and Robert A. Hufnagel, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 5, 1978, Ser. No. 903,377

Int. Cl.² G01B *7/12, 7/34*

U.S. Cl. 33—178 F **3 Claims**



1. Measuring apparatus for internally measuring tubes comprising:

a flexible supporting member capable of being inserted into a tube;

flexible centering devices disposed on said flexible supporting member at various locations along said flexible supporting member for centering said flexible supporting member with respect to the inside surface of said tube while being capable of negotiating constricted portions of said tube;

electromagnetic means disposed in said flexible supporting member for detecting metal members through which said tubes are disposed thereby indicating the longitudinal location of said measuring apparatus in said tube;

a linear variable differential transformer disposed in said flexible supporting member for transforming the force exerted on said linear variable differential transformer into a reading corresponding to the internal diameter of said tube;

a slotted member disposed in said flexible supporting member;

a first and a second link pivotally connected at their first

ends through said slotted member and capable of sliding along said slotted member;

a third link and a fourth link pivotally connected at their first ends to said linear variable differential transformer with the second end of said third link pivotally connected to the second end of said first link and with the second end of said fourth link pivotally connected to the second end of said second link; and

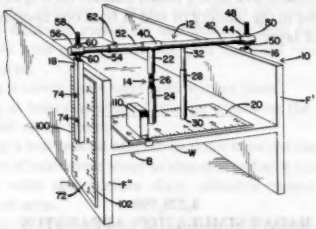
a first roller attached to the connection of said first and third links and a second roller attached to the connection of said second and fourth links, said rollers contacting said inside surface of said tube and causing said third and fourth links to exert force on said linear variable differential transformer when either of said rollers encounters a constriction in said tube with said linear variable differential transformer transforming the so monitored force into readings indicating the internal diameter of said tube.

4,228,594

LAYOUT TOOL FOR LOCATING HOLES ON STRUCTURAL STEEL

Abraham E. Shlager, 4911 Bimini Dr., Brandenton, Fla. 33507

Filed Jun. 6, 1979, Ser. No. 46,201
Int. Cl.³ B23B *49/02*; G01B *5/14*
U.S. Cl. 33—189 **5 Claims**



1. A layout tool for structural steel beams having flanges and a web comprising:

a frame having a central vertical post and a horizontal bridge connected intermediate its ends to the top of the post,

a horizontal plate connected to the bottom of the post, said plate being arranged to rest on the upper surface of the web of the beam when the beam is positioned with its web in a horizontal plane so as to support the tool on the beam,

a pair of legs connected to the ends of the bridge and for extending downwardly therefrom on the outside of the flanges of the beam,

vertical plates connected to the legs for lying against the outer surfaces of the flanges,

and scales provided on each of the plates for measuring distances on the web from one of the flanges and on the flanges from the central plane of the web.

4,228,595

TOOL SETTING GAGE

Harold Steinbach, Rte. 1, Box 165 B, Menasha, Wis. 54962

Filed Apr. 18, 1979, Ser. No. 31,060
Int. Cl.³ G01B *5/00*
U.S. Cl. 33—201 **6 Claims**

1. A tool setting gage for ascertaining the radial and axial position of an element of a tool comprising:

a base member having means for mounting said tool thereon to extend vertically above said base member;

a first pair of spaced, parallel, horizontal rails affixed to said base member;

a first carriage mounted on said first rails for movement toward and away from the tool mounting means normal to the extension of the tool;

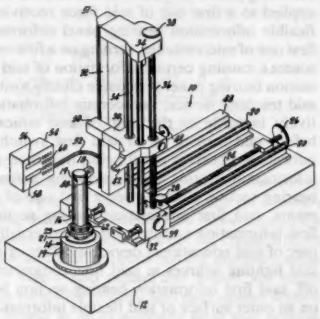
a horizontal lead screw rotatably journalled on said base member intermediate said first rails;

a first nut mechanism mounted on said first carriage and selectively engageable with said horizontal lead screw for providing fine adjustment movement of said first carriage with respect to said tool mounting means and for retaining the first carriage in position on said first pair of rails;

a second pair of spaced, parallel, vertical rails affixed to said first carriage;

a second carriage mounted on said second rails for movement up and down along the extension of the tool;

a vertical lead screw rotatably journalled in said first carriage;



a second nut mechanism mounted on said second carriage and selectively engageable with said second lead screw for providing fine adjustment movement of said second carriage with respect to said tool mounting means and for retaining the second carriage in position on said second pair of rails;

a feeler mounted on said second carriage for contacting the tool element responsive to movement of said first and second carriages;

transducer means for ascertaining the movement of said carriages; and

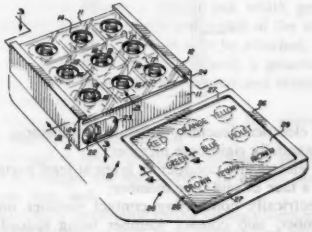
digital readout means coupled to said transducer means for indicating the position of said feeler.

4,228,596

ILLUMINATED TEACHING DEVICE AND BOARD GAME

Linda A. Daniel, Phoenix, Ariz., assignor to Jerry W. Daniel, Phoenix, Ariz., a part interest

Filed Mar. 30, 1978, Ser. No. 891,616
Int. Cl.³ G09B *5/02, 7/00*; A63F *3/00*
U.S. Cl. 35—9 B **7 Claims**



1. An educational device comprising in combination:

a. a plurality of separate compartments each having an opening defined by walls of that compartment, said openings being substantially co-planar;

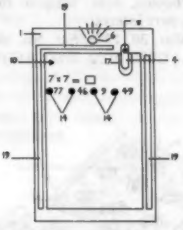
b. a plurality of light sources disposed, respectively, in said compartment;
c. power source means for supplying electrical power to said plurality of said light sources;
d. a plurality of switches for controllably connecting said power source means to said respective ones of said light sources; and
e. a flexible information bearing panel through which light can pass disposed over said plurality of compartments, said flexible information bearing panel including pieces of information corresponding to separate ones of said compartments, each of said plurality of switches being disposed in respective ones of said compartments, said flexible information bearing panel having a plurality of force receiving points located so that when a deforming force is applied to a first one of said force receiving points, said flexible information bearing panel deforms to actuate a first one of said switches, turning on a first one of said light sources, causing certain information of said flexible information bearing panel to become clearly visible to a user of said teaching device, said certain information being relatively invisible to the user of said educational device before said turning on of said first switch, said flexible information bearing panel being translucent, said flexible information bearing panel including a first information bearing section aligned over a first one of said compartments, said first information bearing section containing first information which is clearly externally visible to a user of said educational device whether or not the one of said lighting sources in said first compartment is turned off, said first information bearing section being disposed on an outer surface of said flexible information panel, said flexible information bearing panel including a second information bearing section aligned over said first compartment, said second information bearing section containing second information which becomes clearly visible to a user of said educational device only when said one of said lighting sources in said first compartment is turned on.

4,228,597

TEACHING DEVICE

Abraham R. Albenda, 45 Falmouth St., Brooklyn, N.Y. 11235

Filed Aug. 7, 1978, Ser. No. 931,508
The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.
Int. Cl.[3] G09B 7/06
U.S. Cl. 35—9 B **23 Claims**



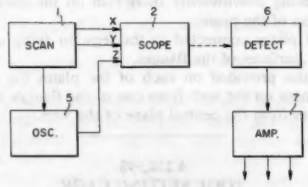
1. An electrical teaching apparatus comprising:
a substantially rigid base member;
a first electrically conductive layer at least partially covering a face of said base member;
an electrically conducting contact member on said base member, said contact member being spaced from and always out of contact with said first electrically conductive layer;
a source of power coupled between said contact member and said first electrically conductive layer;
an indicator means coupled in series circuit with said power source, said first electrically conductive layer and said contact member; and
a question and answer member adapted to overlie said first electrically conductive layer and to engage said contact member, said question and answer member including an electrically insulating bottom control layer which has at least one aperture therein; a second electrically conductive layer; an upper electrically insulating question layer having at least one question imprinted thereon and indicia for selecting an answer, said second electrically conductive layer being interposed between said control and question layers; at least said control layer and question layer being permanently coupled together in registration with each other and with said at least one aperture in registration with a correct answer indicia, said second conducting layer being located at least between said at least one aperture and its associated correct answer indicia; and said question layer covering all but a portion of said second electrically conductive layer, said contact member being engageable with said question and answer member for electrically contacting at least a part of said uncovered portion of said second electrically conductive layer;
whereby when pressure is applied in the area of a correct answer indicia, an electrical circuit is completed to said indicator means from said power source, through said contact member and through said first and second electrically conductive layers which contact each other via said pressure in the vicinity of said at least one aperture in said control layer.

4,228,598

RADAR SIMULATION APPARATUS

Richard T. Warner, London, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 16, 1977, Ser. No. 834,524
Claims priority, application United Kingdom, Sep. 21, 1976, 39152/76
Int. Cl.[3] G09B 9/00
U.S. Cl. 35—10.4 **5 Claims**



1. Radar simulation apparatus comprising a cathode ray tube oscilloscope having a display screen, said oscilloscope having means for producing a movable screen spot, scanning means connected to the oscilloscope for causing the spot to be scanned over the screen in a radar transmitter type scanning pattern, photo-detector means mounted in front of the screen and closely adjacent or on said screen for detecting light from said spot only when said spot is near said photo-detector means and for producing an electrical signal when said light is detected, and modulation means connected to receive and modulate said signal in simulation of a radar pulse repetition.

4,228,599

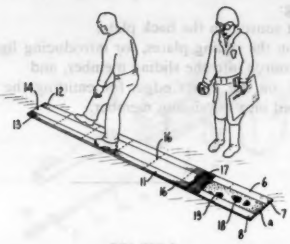
METHOD FOR RECORDING THE WALKING ABILITY OF AN INDIVIDUAL

David F. Webster, 1325A Edwards Ave., Santa Rosa, Calif. 95401

Division of Ser. No. 862,093, Dec. 19, 1977, which is a continuation-in-part of Ser. No. 773,683, Mar. 22, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,769

Int. Cl.[2] B41L 1/00

U.S. Cl. 35—29 R 4 Claims



1. A method for recording a person's ability to walk in a predetermined area comprising the steps of:

providing a bottom sheet with at least one record area and marginal portions on either side of the record area;

placing adhesive means on said bottom sheet only in said record area and maintaining said marginal areas free of adhesive;

placing a cover sheet over said bottom sheet;

placing at least one strip of transfer means on the underside of said cover sheet;

defining a test area on said cover sheet between the marginal edges of said cover sheet so that said test area is coincident only with said bottom sheet adhesive means and said record area;

walking on said test area by a person undergoing a test;

forming prints on said record area only of that portion of a person's foot which contacts said test area and forming a record of a person's path as such person traverses said test area.

4,228,600

SHOE BOTTOM

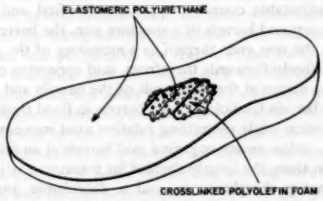
Hans-Dietrich Krug, Heidelberg, and Willi Mildenberger, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,714

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 7807113[U]

Int. Cl.[2] A43B 13/04, 13/12

U.S. Cl. 36—32 R 2 Claims



1. A shoe bottom consisting of a closed-cell crosslinked polyolefin foam having at least one surface with opened cells, the closed cells of the foam layer having a diameter of about 0.3 to 0.9 mm, and a film of an elastomeric polyurethane of about 0.1 to 0.3 mm thickness adhered to said opened cell surface.

4,228,601

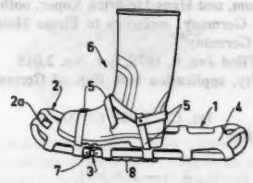
SNOW-SHOE

Peter Lawton, 104 Hägerstensvägen, Hägersten, Sweden (S-126 49), and Per Börjesson, Stockholm, Sweden, assignors to Peter Lawton, Hägersten, Sweden

Filed Jul. 14, 1978, Ser. No. 924,758

Int. Cl.[3] A43B 5/04

U.S. Cl. 36—124 4 Claims



1. A snow-shoe comprising a snow-shoe frame having a support surface adopted to support said frame on a snow surface and fastening means for fastening the snow-shoe to a shoe at a position between the opposite ends of the frame, said frame comprising front and rear portions having mutually adjacent ends positioned below said means and which are interconnected by elastic means for holding said ends against separation and resiliently biased so as to normally hold said portions in alignment with each other and elastically permitting said portions to angularly deflect relative to each other so as to substantially conform to bending of a shoe fixed to the snow shoe by said fastening means.

4,228,602

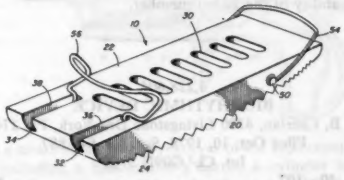
SKI BOOT ATTACHMENT

E. Stuart Groves, Sanders Rd., Hudson, N.H. 03051

Filed Dec. 6, 1978, Ser. No. 966,877

Int. Cl.[2] A43B 5/00, 3/10; A43D 5/00

U.S. Cl. 36—132 8 Claims



1. An attachment for ski boots and the like, comprising

(a) a body portion having a length and width generally corresponding with the length and width of the sole of a boot to which the body portion is to be attached.

(b) said body portion being formed with a generally flat upper face and a longitudinally curved and transversely straight lower tread face,

(c) said body portion being thicker at the mid-portion thereof than at the ends thereof,

(d) a bail hinged to the rear part of said body portion and adapted to engage the heel portion of a boot placed on said upper face, and,

(e) a longitudinally retractable spring loaded clamp mounted to the forward end of said body portion and adapted to engege the toe portion of said boot,

(f) said body portion being formed with at least one longitudinal passage therethrough, a resilient element disposed in said passage, a pin extending transversely through said

body portion and engaging the rearward end of said element and pivotally connected at its ends to said bail, the forward end of said element connected to said clamp,

(g) the forward end of said body portion being formed with a longitudinal slot through the upper face thereof and in communication with said passage.

4,228,603

APPARATUS FOR FOLDING OVER AND PRESSING INTO POSITION THE EDGE STRIPS OF TWO MATERIAL WEBS

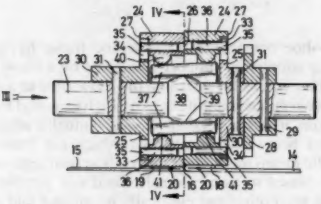
Theo Groenebaum, and Hans-Heinrich Kuper, both of Rietberg, Fed. Rep. of Germany, assignors to Firma Heinrich Kuper, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 2,015

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801569

Int. Cl.[2] D06F *69/00*

U.S. Cl. 38—1 B **9 Claims**



1. An apparatus for folding over and pressing into position the edge strips of two material webs, stitched together along the seam, comprising two co-operating superposed feeding and pressing devices, one of said feeding and pressing devices including two cylindrical jacket members of substantially identical size, which members are radially displaceably mounted relative to each other and, at their respective outer end faces are axially retained by two respective lateral end plates, in which radial grooves are machined in each lateral end plate at its outer circumference, into which grooves axial cams secured to a respective one of the associated jacket members project, whereby a spacing is maintained between the grooves and the cams, which spacing determines the radial displaceability of the jacket member.

4,228,604

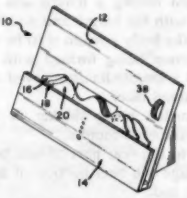
BIORHYTHMIC DEVICE

Gabriel B. Cherian, 4200 Livingstone Dr., York, Pa. 17402

Filed Oct. 10, 1978, Ser. No. 949,887

Int. Cl.[3] G09D *3/00*

U.S. Cl. 40—107 **1 Claim**



1. A biorhythmic device comprising:

a. a back plate having a front surface that displays indicia depicting a time period divided into days with said days being represented by spaces defined by spaced vertical lines, said indicia further comprising a horizontal line dividing the spaces into upper and lower regions;

b. three sliding members, each comprising a translucent sheet having a lower edge and an upper edge, said upper edge having a sine wave contour of a different biorhythmic cycle; said sliding members overlay each other and the back plate such that the sine wave contours overlay the time period indicia, said sliding members are slidable, in relation to the other members and the back plate, in the direction of the horizontal line, thus providing means to define positive and negative regions and transition points on the cycles; and

c. means for edge illuminating the sine wave contours comprising:

a light source on the back plate,

means, on the sliding plates, for introducing light from the light source into the sliding member, and

means, on the upper edge, for emitting the light introduced into the sliding member.

4,228,605

ADJUSTABLE COUPLING APPARATUS FOR SUPERPOSED BARRELS OF A SPORTING GUN OR THE LIKE

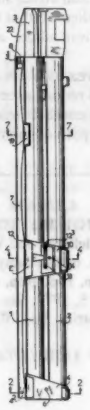
Georges Chacornac, Saint-Etienne, France, assignor to Manufacture Francaise d'Armes et Cycles de Saint-Etienne Manufrance S.A., St. Etienne, France

Filed May 25, 1978, Ser. No. 909,658

Claims priority, application France, May 27, 1977, 77 16935

Int. Cl.[3] F41C *21/06*

U.S. Cl. 42—1 R **12 Claims**



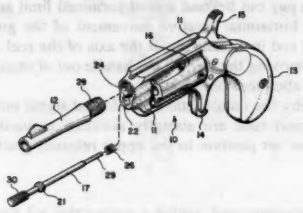
1. An adjustable coupling apparatus for first and second spaced superposed barrels of a sporting gun, the barrels being secured at the rear ends thereof to a mounting of the gun and projecting freely forwards therefrom, said apparatus comprising holding means at the front ends of the barrels and fixed to one of the barrels for holding said barrels in fixed transversely spaced relation while permitting relative axial movement therebetween, collar means engaging said barrels at an intermediate location along the lengths thereof for transverse adjustment of the spacing therebetween, and a detachable and interchangeable sight band disposed above the upper one of the barrels and secured to said mounting, said sight band being slidably mounted on said holding means to permit slidable movement of said holding means and said one barrel to which it is fixed while said band remains stationary.

4,228,606

MEANS FOR MOUNTING CYLINDER TO FRAME OF SMALL HAND GUN

Richard J. Casull, P.O. Box 276, Freedom, Wyo. 83120

Filed Nov. 20, 1978, Ser. No. 961,979
Int. Cl.[3] F41C *1/00*
U.S. Cl. 42—59 4 Claims



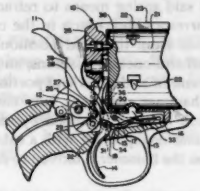
1. In a small, single action revolver of the type comprising a frame including a handle and a barrel, a cylinder having a plurality of cartridge-receiving chambers and being rotatably mounted in the frame by a cylinder axis pin which extends through a central bore in the cylinder and engages axially aligned bores, respectively, in the front and rear portions of the frame, and a hammer mounted to the frame for reciprocal, pivotal movement between fired and cocked positions, with said cylinder being adapted for partial rotation each time the hammer is pivoted from its fired position to its cocked position, the improvement comprising a particular cylinder axis pin and cooperating means for releasably locking the cylinder axis pin in engagement with the frame of the revolver, said particular cylinder axis pin comprising an elongate, substantially cylindrical pin having a lug extending from the cylindrical surface of the pin in a direction substantially normal to the cylindrical axis of said pin, and said cooperating means for releasably locking the cylinder axis pin in engagement with the frame comprising a counterbore extending inwardly, coaxially with said aligned bores in said frame, into the front portion of the frame from the front or barrel side thereof, with said counterbore having a radius at least equal to the radius of said bore in said front portion plus the height of said lug extending from the cylindrical surface of said pin, a downwardly extending lip at the front or barrel side of said front portion of said frame, said lip covering the top portion of the open end of said counterbore without covering any portion of the open end of said bore in said front portion of the frame; and a cylindrical coil spring positioned in said counterbore, whereby when the cylinder is placed in the frame in axial alignment with said bores in the front and rear portions of the frame, respectively, and when said pin is aligned with said bores with the lug extending in a downward direction away from the lip covering the top portion of said counterbore, said pin can be inserted from the front or barrel side of said front portion through the coil spring in said counterbore so as to extend through the bore in said front portion, the bore in said cylinder and into the bore in said rear portion, and the pin is releasably locked in engagement with the frame by pushing the pin sufficiently into said bores so that said lug thereon pushes against said coil spring and slides past said lip into said counterbore, whereupon the pin is rotated so that when the pin is released, the spring pushes the lug thereon into contact with said lip.

4,228,607

SINGLE ACTION REVOLVER WITH SAFETY LOCKING CYLINDER

Richard J. Casull, P.O. Box 188, Freedom, Wyo. 83120

Continuation-in-part of Ser. No. 759,416, Jan. 14, 1977, Pat. No. 4,126,953. This application Nov. 20, 1978, Ser. No. 962,140
Int. Cl.[3] F41C *1/00*
U.S. Cl. 42—66 1 Claim



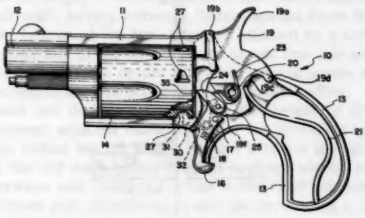
1. In a single action, single barreled revolver having a frame, a cylinder containing a single set of chambers, a hammer and a firing pin mounted in the frame rearwardly of the cylinder in alignment with the barrel the improvement which comprises a cylinder web containing a series of apertures located between the chambers into which the firing pin may be inserted when the cylinder has been rotated to place the firing pin in alignment with one of said apertures and when the hammer has been pressed forward thereby locking the cylinder such that the chambers are out of battery position.

4,228,608

CYLINDER LOCKING MECHANISM FOR SMALL REVOLVERS

Richard J. Casull, P.O. Box 276, Freedom, Wyo. 83120

Filed Nov. 20, 1978, Ser. No. 961,980
Int. Cl.[3] F41C *1/00*
U.S. Cl. 42—67 8 Claims



1. In a small, single action revolver of the type comprising a frame including a handle and a barrel, a cylinder having a plurality of cartridge-receiving chambers, said cylinder being rotatably mounted in the frame and having spaced notches formed thereabout, a spring biased hammer mounted to the frame for reciprocal, pivotal movement between fired and cocked positions, means for rotating the cylinder to bring a subsequent chamber in the cylinder into alignment with the barrel when the hammer is pivoted from its fired position to its cocked position, cylinder locking means, which provides for releasably locking the cylinder in its proper aligned position each time the hammer is cocked, and a side cover plate which is attached to the frame and encloses the hammer, trigger, cylinder rotating means, and cylinder locking means in a recess in the frame of the revolver, an improved cylinder locking means comprising:

a rocker latch member being pivotally connected at a position between its ends to the side cover plate, with one end portion of said latch member being positioned adjacent to the lower side of the cylinder and having a locking lug thereon adapted to make releasable, locking engagement

with the notches of said cylinder, and with the other end portion of said latch member being positioned close to one of the sides of the hammer;

first spring means acting upon said latch member biasing the locking lug thereon into engagement with said notches in said cylinder;

an actuating member projecting outwardly from the hammer and adapted to: (a) strike the underside of said other end portion of said latch member and pivot the latch member against said spring means to retract said locking lug from the corresponding notch in the cylinder as the hammer is moved from the fired position to a position between the fired and cocked positions, and (b) to escape beyond the free end of said other end portion of said latch member as the hammer attains its fully cocked position; whereby the latch member is biased by said first spring means to move into engagement with a subsequent notch in said cylinder as the hammer is moved to its fully cocked position; and

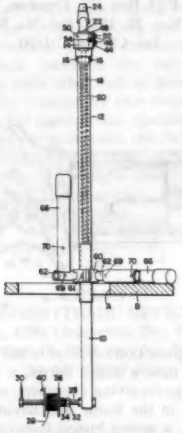
camming means in combination with said latch member and actuating member which is adapted to permit the actuating member, upon firing of the revolver, to slide past the free end of said other end portion of said latch member without pivoting the latch member or retracting the locking lug from the notch in said cylinder as the hammer moves from the cocked position to the fired position.

4,228,609

ICE FISHING DEVICE

Lawrence J. Gonnello, 27 Lake Dr., Belchertown, Mass. 01007

Filed Jun. 21, 1979, Ser. No. 50,556
Int. Cl.[3] A01K *91/06*
U.S. Cl. 43—16 **5 Claims**



1. In a fishing device for ice fishing, the combination of:

a vertically disposed reel support tube for extension into an ice hole,

an adjustable bridging means for resting upon the ice surface and bridging the ice hole and supporting the upper portion of the reel support tube upwardly of the ice and the lower portion of the reel support tube downwardly of the ice,

an outer tube sleeving the reel support tube and extending upwardly therefrom above the ice and having an open topped cap thereon,

a combination handle and signal means operatively connected to the reel support tube,

the combination handle and signal means being movable between a lower set position and an upper released position relative to the outer tube sleeving the reel support tube

spring means within the outer tube and extending between and fixed to the reel support tube and the cap,

an abutment on the cap,

a stop on the handle selectively engageable with the abutment,

a guide projecting radially outwardly of the reel support tube at the lower end thereof,

a line carrying reel rotatably mounted upon the guide,

spring means on the guide and bearing on the reel for moving the reel along the guide in an outboard direction as the line is paid out responsive to fish nibbling,

a stop means for precluding reel outboard movement and line pay out beyond a predetermined limit and for effecting horizontal rotative movement of the guide and reel and rod in a plane about the axis of the reel support tube for moving the stop on the handle out of engagement with the abutment on the cap,

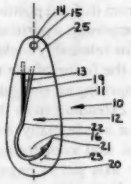
whereby the combination handle and signal means and reel support tube are abruptly actuated upwardly from the lower set position to the upper released position.

4,228,610

WEEDLESS FISHING LURE

Edward M. Anderson, Plymouth, Minn., assignor to Henry C. Kovar, Anoka, Minn., a part interest

Filed Jun. 18, 1979, Ser. No. 49,294
Int. Cl.[3] A01K *85/00*
U.S. Cl. 43—42.41 **23 Claims**



1. A weedless fishing lure comprising:

(a) a body having a leading end, means for connecting the leading end to a fishing line, and a concavity in one side of the body and aft of the leading end;

(b) hook securing means mounted to the body for rotatably securing a fish hook to the body;

(c) a fish hook rotatably secured to the securing means and having

(1) an elongate shank,

(2) a curl of approximately 180 degrees in between the shank and a hook point, said curl being skewed from the shank, and

(3) an apex where the curl adjoins the shank; and

(d) a resilient spring reactively mounted in between the body and the rotatable hook, said spring rotatably positioning the hook with respect to the body in a normally weedless position in which the hook point is within the concavity and in which the hook apex projects outwardly of the body, said spring being operable for resiliently returning the hook to the normal weedless position from an alternate fish catching position in which the hook is rotated with respect to the body with the apex having been depressed toward the body and the hook point being exposed outside of the concavity and the body.

4,228,611

METHOD FOR FABRICATING FISHING LURES ETC.

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Division of Ser. No. 760,920, Jan. 21, 1977, Pat. No. 4,095,315.
This application May 16, 1978, Ser. No. 905,738
Int. Cl.[3] A01K *85/00*
U.S. Cl. 43—42.53 4 Claims

1. A method for fabricating a fishing lure comprising the steps of:

producing a molded lure body incorporating hook hangers with a secured end and a free end which engages a cooperating bore; and pressing the eye portion of a hook into said bore until it engages said hook hanger by forcing said free end out of engagement with said bore wall and then permitting said free end to pass through the hook eye to reengage said bore wall.

4. A method of assembling a fishing lure having biased hook retainers located in recessed cups, with a free end of said hook retainers engaging the side wall of said recessed cups, comprising:

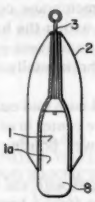
pressing the eye of each hook into each of said cups until said hook retainer free end is forced away from said side wall and enters said hook eye and reengages said side wall.

4,228,612

FISHING EQUIPMENT

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan

Filed Aug. 31, 1978, Ser. No. 938,472
Claims priority, application Japan, Oct. 18, 1977, 52-124902
Int. Cl.[3] A01K *91/02*
U.S. Cl. 43—43.13 2 Claims



1. A piece of fishing equipment comprising:

a hollow main body having a shell shape, an open rear end, and a tapered front end terminating in an opening aligned with an axis of the main body;

a hollow tapered member formed integral with the main body and extending axially forward therefrom, the tapered member having open front and rear ends cooperating with the main body to define an axially-extending bore;

a plurality of fins formed integral with and projecting radially outward from the integral main body and tapered member, said fins having substantially straight mid portions, arcuate-shaped leading edge portions extending from the mid portions to portions of the tapered member adjacent the open front end, and trailing edge portions extending at an acute angle from the mid portions to portions of the main body adjacent the open rear end;

a stop plug inserted into said main body; and

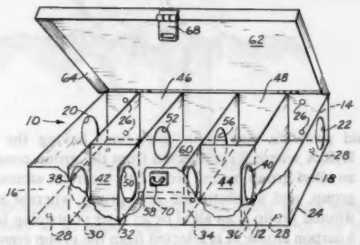
a swivel connected to the leading end of the tapered member.

4,228,613

TAMPER PROOF RODENT BAITING STATION

Kenneth A. Kalnasy, and Marcia Kalnasy, both of Madison Heights, Mich., assignors to Kaplan-Stern Environmental, Inc., Troy, Mich.

Filed Aug. 21, 1978, Ser. No. 935,659
Int. Cl.[3] A01M *25/00*
U.S. Cl. 43—131 10 Claims



1. A rodent baiting device comprising:

a substantially rectangular box having upright side and end walls, said end walls each having openings therein adjacent to a common first side of the box to permit rodents to enter the interior of the box;

a plurality of baffle members disposed parallel to the end walls and extending across the entire width of the box and the full height of the box, the outermost baffles nearest the end walls having openings therein spaced from the top and bottom of the box, disposed adjacent to a common second side of the box, opposite to said first side so as to prevent children or the like from gaining access to the section of the box between the outermost baffles;

at least one divider extending the full height of the box between adjacent baffle members for providing at least one rodent feeding station located between the openings in the end walls of the box and an entry section located between said openings in the baffles and accessible to rodents only therethrough, said divider having a central opening connecting the feeding station to the entry section;

a cover for the box; and

means for securing the cover to the box to prevent unauthorized tampering.

4,228,614

FLOATING PESTICIDE DISPENSER

Nathan F. Cardarelli, Barberton, Ohio, assignor to Environmental Chemicals, Inc., Wauconda, Ill.

Continuation-in-part of Ser. No. 5,174, Jan. 22, 1979, which is a continuation-in-part of Ser. No. 916,570, Jun. 19, 1978, Pat. No. 4,166,111. This application Feb. 22, 1979, Ser. No. 14,118
Int. Cl.[3] A01M *1/20, 25/00;* A01N *55/04*
U.S. Cl. 43—131 65 Claims

1. A floating pesticide dispenser, comprising:

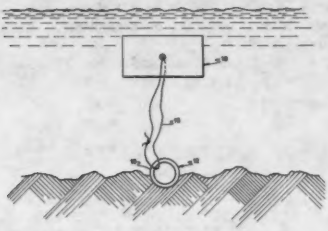
a floating thermosplastic dispenser containing a pesticide and having a density less than 1.0 grams per cc,

said thermoplastic dispenser containing a thermoplastic copolymer selected from the group consisting of a copolymer of ethylene-vinyl acetate, a copolymer of ethylene-

propylene, and combinations thereof, said ethylene-vinyl acetate copolymer having from about 60 to about 95 percent by weight of ethylene and a weight average molecular weight of from about 40,000 to about 400,000,

said ethylene-propylene copolymer having from about 30 percent to about 80 percent by weight of ethylene, and a weight average molecular weight of about 50,000 to about 250,000,

said dispenser containing a pesticide for use in an aqueous environment for destroying aquatic pests,



said pesticide may be a compound having the formula R_3S_nX where R_3 is selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, an aryl group, and a substituted aryl group wherein said substituted group is an alkyl or an ester containing from 1 to 6 carbon atoms; X is selected from the group consisting of a halogen, an oxide, an alkoxy OR^1 where R^1 is an alkyl having from 1 to 12 carbon atoms, or an

group where R" is an alkyl having from 1 to 12 carbon atoms, the amount of said pesticide ranging from about 2 parts to about 80 parts by weight per 100 parts of said thermoplastic copolymer when the pesticide is not of formula R_3S_nX and when said pesticide is said R_3S_nX compound, the amount of said R_3S_nX pesticide ranging from about 25 parts to about 75 parts per 100 parts of said copolymer, and

a weighted anchor, said weighted anchor connected to said dispenser and said pesticide being slowly released from said thermoplastic dispenser.

4,228,615

SMALL-SIZE TOY ANIMAL HAVING ARTICULATED LIMBS

Athos Melotti, Via Dello Spalto, 3, Bologna, Italy

Filed Sep. 5, 1978, Ser. No. 939,717

Claims priority, application Italy, Sep. 15, 1977, 4880/77[U]

Int. Cl.[3] **A63H** *11/00, 33/00, 3/20, 3/45*

U.S. Cl. 46—22 **2 Claims**

1. An articulated limb toy animal, comprising a pair of front limbs and a pair of hind limbs articulated to a trunk of the toy animal, in each said limb pairs said limbs being joined to each other by a horizontal axis cylindrical stem adapted for articulation with said trunk of the toy animal, said trunk having at the front and hind portions thereof seats for pivotal engagement with said stems, a suitable cutout for insertion of said stem into a respective one of said seats, the front limb stem further engaging a head piece for the toy animal, said head piece having at the bottom a similar engagement seat and wherein said trunk defines a front and a rear circular portions, suitably radiused, having a flattened shape in a vertical plane, and formed with a respective central hole adapted to act as said pivotal engagement seat for said stems of the toy animal limbs, said stems

entering by press fit said holes through respective cutouts radially extending with respect to said portions.

4,228,616

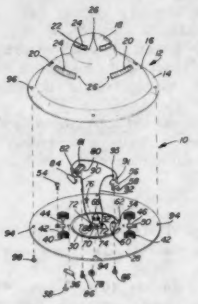
FLYING SAUCER TOY

Donald C. Wilson, 18085 Birchcrest, Detroit, Mich. 48221

Continuation-in-part of Ser. No. 894,198, Apr. 5, 1978. This application Dec. 26, 1978, Ser. No. 973,222

Int. Cl.[3] **A63H** *33/26*

U.S. Cl. 46—228 **5 Claims**



1. A flying saucer toy comprising:

a translucent circular plastic housing having a plurality of arcuate slits in an upper surface;

a colored transparent membrane covering the slits, and a blinking light source within the housing;

a cover of semi-rigid translucent plastic sheet having an outer rim extending horizontally outward around its periphery;

a lower housing integral with said outer rim curving upward and inward toward the center in an arcuate manner, terminating where the lower housing blends into an upper housing;

the upper housing integral with the lower housing curving upward and inward to form a hemisphere;

a first plurality of arcuate openings around the upper periphery of the lower housing spaced down a distance from the upper housing;

a second plurality of arcuate openings around the upper housing spaced up a distance from the lower housing;

a colored transparent membrane covering the first and second arcuate openings;

means for attaching the membrane to the space surrounding the openings;

a bottom member of semi-rigid plastic sheet having a shape complimentary to the outer rim, a circular slit at the center of the bottom member forming a cover, the slit ending

short of a full circle to form a hinge joining the cover to the bottom member;

means for holding the cover closed;

an electrical switch having an open and closed position;

means for producing electrical energy, a flasher light bulb socket, and a light bulb attached to the cover, electrical conductors interconnecting the electrical energy means to the switch, the socket, and the bulb to cause the bulb to glow intermittently when the switch is closed;

a plurality of rotatable wheels for supporting the flying saucer on a surface, a plurality of openings in the bottom member through which the wheels project, means for attaching the wheels to the bottom member; and

means for attaching the bottom member to the outer rim.

4,228,617

METHOD FOR GRINDING GLASS PLATES AND THE LIKE THROUGH NUMERICAL CONTROL AND BEVELING MACHINE THEREFOR

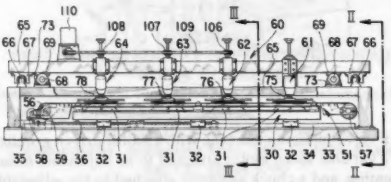
Shigeru Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd, Tokushima, Japan

Filed Dec. 12, 1978, Ser. No. 968,774

Claims priority, application Japan, Dec. 31, 1977, 52/158164; Feb. 6, 1978, 53/012788; Mar. 5, 1978, 53/025109; Mar. 6, 1978, 53/025838; Sep. 9, 1978, 53/110850; Sep. 24, 1978, 53/116994

Int. Cl.³ B24B *9/10*

U.S. Cl. 51—3 **14 Claims**



1. A method for grinding glass plates through numerical control comprising fixing the glass plates on a plurality of fixing stands mounted on a table, and relatively moving the glass plates and working wheels in biaxial directions in a horizontal plane while rotating each working wheel held on each of a plurality of working heads mounted opposing each fixing stand respectively as well as spinning each working wheel around a vertical axis going through a working point so that each working wheel works the glass plate to be worked at substantially the same portion of a working face, wherein the movement in the horizontal plane of the glass plates and the working wheels and the spinning movement of the working wheels are controlled by numerical control means, and after finishing one grinding process on one fixing stand, the glass plates are conveyed to the succeeding fixing stand for an additional grinding process.

4,228,618

ROTARY DISC SANDER WITH TILTABLE WORK SUPPORT TABLE AND SANDER DUST COLLECTION UNIT

Flemming E. Jensen, Portland, Oreg., assignor to Industrial Patterns & Molds, Inc., Portland, Oreg.

Filed Jan. 8, 1979, Ser. No. 1,954

Int. Cl.³ B24B *41/06*

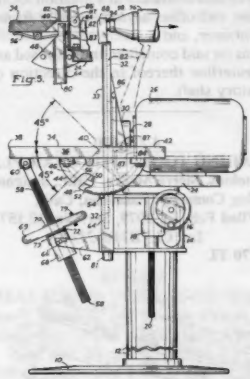
U.S. Cl. 51—125.5 **8 Claims**

1. In combination with a sander having a base and a motor driven sanding member mounted on the base for movement of its work sanding surface in a vertical plane, a work support table assembly comprising:

(a) a carriage mounted on the base for movement vertically with respect to the sanding member,

(b) a table having side, front and back margins,

(c) a pair of interengageable table mounting pivot means on the carriage and table located laterally outward of the opposite sides of the sanding member and adjacent the back ends of the side margins of the table for mounting the table for pivotal movement about an axis disposed substantially parallel to and closely adjacent the back margin of the table and the vertical sanding plane of the sanding member,



(d) an elongated table supporting and tilting screw secured pivotally at its upper end to the underside of the table adjacent the front margin and midway between the side margins thereof, and

(e) coupling means on the carriage engageable releasably with the screw for securing the table releasably in selected positions of angular adjustment of its work supporting surface relative to the work sanding plane of the sanding member.

4,228,619

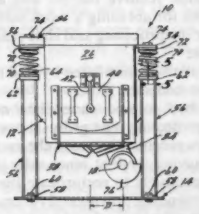
VIBRATORY FINISHING MACHINE

Gordon H. Anderson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Continuation of Ser. No. 833,001, Sep. 14, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,187

Int. Cl.³ B24B *31/00*

U.S. Cl. 51—163.1 **5 Claims**



1. A vibratory finishing machine comprising:

a tub-like container having a substantially open upper side and defining a peripheral rim portion, said container adapted to receive workpieces and a finishing media,

means for imparting vibratory movement to said container and thereby causing said media to perform a finishing operation on said workpieces,

said last mentioned means including,

a support structure for said container and including a base adapted to rest upon a support surface,

said support structure also including a container support

section projecting upwardly from said base to a position subjacent said rim portion of said container,

spring means connected between the uppermost part of said support section and said container rim for resiliently supporting said container thereon,

a vibratory mechanism including,

an eccentrically weighted vibratory shaft,

said shaft extending substantially parallel to the longitudinal axis of said container at a position located below said container and offset asymmetrically from the center of said container, and

weight means on said container and disposed asymmetrically of said centerline thereof in the direction opposite from said vibratory shaft.

4,228,620

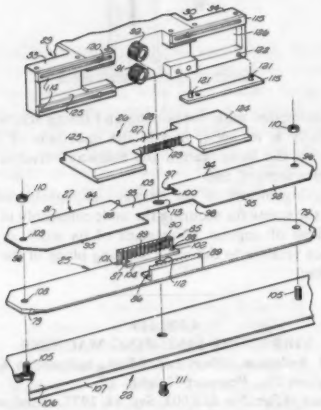
ABRADING TOOL WITH WEAR PLATE

Donald H. Hutchins, Sierra Madre, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

Filed Feb. 14, 1979, Ser. No. 12,157

Int. Cl.³ B24B *23/00*

U.S. Cl. 51—170 TL **9 Claims**



1. A portable abrading tool comprising:

a body structure;

a shoe plate carried at the underside of said body structure for reciprocation relative thereto and adapted to carry abrading means for abrading a work surface;

motor means for reciprocating said shoe plate relative to said body structure;

a pair of gears rotatively oscillated by said motor means at a location above said shoe plate;

two racks attached to said shoe plate at opposite sides thereof and projecting upwardly above the shoe plate with said gears received between the racks;

said two racks having teeth at inner sides thereof engaging said gears respectively to reciprocate the shoe plate;

guide elements extending downwardly from said body structure at opposite sides thereof and having portions received beneath the shoe plate to retain and guide it for reciprocating movement;

said body structure having a first pair of bearing structures facing downwardly toward the shoe plate near opposite edges thereof and at a location forwardly of said racks, and having a second pair of bearing structures facing downwardly toward the shoe plate near opposite edges thereof at a location rearwardly of said racks; and

a wear plate removably attached to said shoe plate at the upper side thereof for reciprocating movement with the shoe plate relative to said body structure and movably engaging all four of said bearing structures in a relation retaining said shoe plate against upward movement relative to the body structure as the shoe plate reciprocates;

said wear plate having a relatively wide forward portion movably engaged near opposite edges thereof by both of said bearing structures of said first pair, and having a relatively wide rear portion movable engaged near opposite edges thereof by both of said bearing structures of said second pair, and having a longitudinally intermediate portion extending between and interconnecting said front and rear portions and narrower than said front and rear portions and received between said two racks.

4,228,621

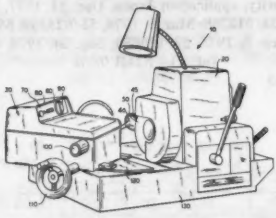
VALVE SURFACING MACHINE WITH VARIABLE SPEED CHUCK

John C. Wagor, Cedar Rapids, Iowa, assignor to Kwik-Way Manufacturing Company, Marion, Iowa

Filed Feb. 22, 1979, Ser. No. 13,930

Int. Cl.³ B24B *19/00*

U.S. Cl. 51—241 VS **1 Claim**



1. In a valve surfacing machine with a motor driven grinding wheel, a variable speed motor attached to an adjustable means for mounting, and a chuck assembly attached to the adjustable means for mounting, the chuck assembly rotatably grips the stem of the valve to be surfaced and includes means for releasing the stem of the valve, an improvement comprising:

a one-way clutch connected between an output shaft of the variable speed motor and the chuck assembly, and

a manually rotatable knob separate from the means for releasing and connected to the chuck assembly,

whereby said one-way clutch connects rotation of the output shaft of the variable speed motor to the chuck assembly when the output shaft rotates in one direction so that the valve may be surfaced and disconnects the output shaft of the variable speed motor from the chuck assembly when the chuck assembly is manually rotated by means of said knob to permit an operator to optically inspect the valve surface without disturbing the axial position of the valve relative to the chuck assembly.

4,228,622

AUTOMOBILE SHELTER APPARATUS

Ilija Tisma, 4563 Polk St., Gary, Ind. 46408

Filed Aug. 11, 1978, Ser. No. 933,100

Int. Cl.³ E04H *6/04*; E04B *1/343*

U.S. Cl. 52—3 **1 Claim**

1. An automobile shelter apparatus comprising:

spaced upright side walls, a top wall connecting said side walls and an upright end wall connecting said side walls and top wall to form an open ended housing;

said housing at said open end thereof having a vertical elevation to cover the windshield component of the automobile;

said upright end of said housing having a vertical elevation to cover the hood component of the automobile;

at least one of said upright sides having a hinged panel for

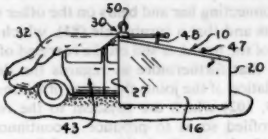
pivoting exterior of said housing to longitudinally extend the open end thereof;

a shaft member horizontally supported across said top wall;

a sheet member convolutely rolled on said shaft member;

spaced longitudinal and lateral elongated members fixed to each other to form a rectangular frame supported on said top wall of said housing;

spaced means on said top wall of said housing to guide said spaced longitudinal elongated members when extended over said automobile;



means on said top wall for restricting pivotal movement of said frame when said frame is extended over said automobile;

said shaft member being rotatable to lay out said sheet member over said frame when said frame is extended over said automobile; and

means for rotating said shaft to convolutely roll said sheet member on said shaft.

4,228,623

PREFABRICATED SELF-SUPPORTING MODULAR ROOM ELEMENTS

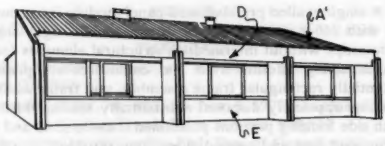
Ennio Menosso, via Papa Giovanni XXIII, Pradamano (Udine), Italy (33040)

Filed May 15, 1978, Ser. No. 906,246

Claims priority, application Italy, Mar. 3, 1978, 83346 A/78

Int. Cl.[2] E04H 9/06

U.S. Cl. 52—79.3 **4 Claims**



1. A building formed from plural precast, inter-connected elements in which said elements are adapted to be oriented into a plurality of configurations comprising: a first element having edges defined by a substantially inverted "U" shaped configuration including vertical legs and a planar top portion canted relative to a horizontal plane whereby a plan view of either of said vertical legs would define a trapezoid and means along the edges thereof to fasten said first element further including a second element having edges defined by a substantially inverted "L" shaped configuration including one vertical leg and one horizontal leg having means along the edges thereof to fasten said second element to another element including a third element having edges defined by a parallelepiped box shape, open along its top extent, having a door-type passageway on a first vertical wall, second and third opposed walls orthogonally fastened to said first wall, and a fourth wall facing said last named wall wherein said second and third walls extend beyond said first and fourth walls thereby providing an outwardly extending sheath, and means along the edges to fasten said third element to another element wherein said means along the edges to fasten said elements includes a recess along said edge, and an iron bar extending into said recess from one wall's edge of said element, said iron bar forming a loop in said recess and extending back into said one wall's edge and in which a first set of two of said elements have their recesses in registry whereby their respective loops overlap further including a tying bar extending through said loops and said recesses are filled with cementitious material and wherein said first set of elements is fastened to a supporting base through stirrup means, in which said stirrup means is defined by a pair of U-shaped elements embedded in said base and extends upwardly therefrom facing each other such that an open area of each U stirrup faces away from each other and a wall of an element is affixed therebetween.

4,228,624

HEAT-SOUND INSULATING WALL

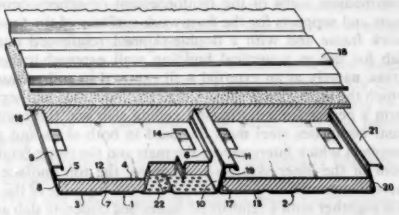
Patrick Reneault, Garches, and Francis Ovaert, Paris, both of France, assignors to SMAC ACIEROID, Paris, France

Filed Jan. 19, 1979, Ser. No. 5,017

Claims priority, application France, Jan. 26, 1978, 78 02128

Int. Cl.[3] E04B 1/82

U.S. Cl. 52—145 **8 Claims**



1. A heat-sound insulating wall which is light and not intended to be used as a load-bearing wall but to be attached to a rigid support structure such as a frame of a building, said insulating wall comprising an acoustic box structure which comprises a substantially U-sectioned sheet which has a mid-portion which defines a first side of the box structure and is slightly ribbed and opposed flange portions which are spaced apart and extend from one side of the mid-portion, and a flat sheet which extends across the whole of the U-sectioned sheet and is wholly spaced from said mid-portion and fixed to the flange portions and defines a second side of the box structure, the flange portions extending beyond said flat sheet relative to said mid-portion and thereby forming rib structures on said second side of the box structure, a thin panel of sound insulating high-density mineral wool which extends across the whole of the box structure from one flange portion to the other opposed flange portion and is disposed in the space between said mid-portion and said flat sheet, a pad of flexible porous material affording a heat insulation and having a weight substantially similar to the heat insulation and weight of an insulating mineral wool felt structure, said pad adjoining the whole of said second side of the box structure and said rib structures and having a thickness which exceeds the thickness of said panel and exceeds the dimension of said rib structures measured from said flat sheet and laterally overlapping the rib structures and an outer panel which bears against and protects said pad and has ribs or corrugations which extend in a direction perpendicular to the ribs of said mid-portion.

4,228,625

CONSTRUCTION SYSTEM

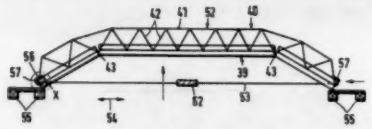
Dittmar Ruffer, Danziger Strasse 47, and Edmund Wagner, Beethovenstrasse 10, both of D-6200 Wiesbaden, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,017

Claims priority, application United Kingdom, Feb. 13, 1978, 90/78

Int. Cl.[3] **E04C** *2/06*

U.S. Cl. 52—223 R **22 Claims**



1. construction system with a girder reinforcement comprising bent diagonal strut and a bottom flange for a wholly or partially prefabricated ferroconcrete wall or slab containing at least one reinforcement mat the longitudinal bars of which are partially surrounded by the bent diagonal struts of the girder member, at least the bottom flange of which bears on transversely oriented mats, and formwork for producing double-skinned concrete components, more particularly of reinforced concrete, ceiling or wall slabs comprising two concrete skins situated at a distance from each other and connected to each other by means of the reinfocement, formwork surfaces associated with a formwork frame and having openings for the intermediate webs of the reinforcement or other connecting parts and supports for the formwork surfaces of the top formwork frame and with a double-skinned reinforced concrete slab for use as a vertical building wall exposed to bending stress, namely as an external wall exposed to soil pressure, in which the inner skin is shorter than the outer skin and serves to form a bearer for a horizontal ceiling slab and the reinforcement comprises steel mats disposed in both skins and girder members which interconnect the mats and the rising reinforcement of the inner skin projects above the top endface edge thereof approximately to the height of the top edge of the outer skin together with a reinforced, haunched concrete slab as well as with apparatus for aligning abutting prefabricated construction slabs with a transverse bar on one of whose ends there is mounted an internal longitudinal bar which bears upon the surfaces of two of the construction slabs and whose other end is provided with a longitudinal slot into which a wedge is driven approximately parallel with the internal longitudinal bar and bears on the other surfaces of the construction slabs and thus aligns them, together with a device for aligning prefabricated slab-shaped wall elements and a device for the thermal insulation of joints which exist between abutting double-skinned concrete slabs in which a thermal insulating mat bears on the inside of one of the concrete skins, characterized in that as regards reinforcement there is provided a lattice girder with only one top flange and one bottom flange (**1,2**) and at least one of the said flange bars is supported by a strut (**11**) extending transversely to the plane of the girder and extending to a longitudinal bar (*7a*) of the mat (*8b*) and that as regards the formwork two formwork frames (**15,16**) are separated from each other and are maintained at a distance by spacer feet (**17**) mounted on only one of the two formwork frames (**15,16**) and that as regards to double-skinned reinforced concrete slab the rising reinforcement (**34**) of the inner skin (**33**) is bent towards the outer skin (**31**) in the region of the horizontal top support edge (**36**) of the inner skin (**33**) so that the support edge (**36**) remains substantially undisturbed and extends approximately to the top edge (**38**) of the outer skin (**31**) and that as regards the reinforced haunched concrete slab each of its ends is provided with a slot (**56**) through which extends a tie bar (**53**) which interconnects both ends and at its own ends is anchored on the slab by means of an L-profile piece (**57**) one of whose members (**58**) bears on the top of the slab (**39**) and the tie bar (**53**) is connected to the other member (**59**) of the profile piece which bears on the end edge of the slab, also that with respect to the device for aligning abutting prefabricated slabs the inner longitudinal bar (**67**) is inserted into a longitudinal slot (**68**) of the transverse bar (**66**) and that in the device for aligning prefabricated slab-shaped wall elements a connecting bar (**76**) is inserted into a joint between two abutting wall elements (**72,73**) and the front end of said bar has welded to it a transversely extending retaining bar (**77**) which bears on one of the surfaces of the wall elements, that a board (**79**) is provided with an open hole (**80**) by means of which it is slid on the rearward end of the connecting bar and bears on the other surface of the wall elements and that a turnbuckle (**81**), which bears on the free surface of the board, is slid on the rear end of the connecting bar and that furthermore as regards the device for the thermal insulation of the joints the edges of the thermal insulating mats (**99, 102**) which are adjacent to the relevant joints (**103**) are profiled so as to produce a continuous reception space along the longitudinal direction of the joint (**103**), the profile of the outside (**110**) of said space being broader than on the inside (**111**) and that a bar (**104, 109**) of thermally insulating material with a profile corresponding approximately to the profile of the reception space is inserted therein.

4,228,626

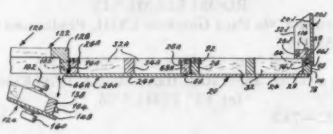
PREFABRICATED PANEL MODULE CONSTRUCTION

Stanley F. Trampe, 920 Greeley Ave., Webster Groves, Mo. 63119

Filed Dec. 27, 1977, Ser. No. 864,493

Int. Cl.[2] **E04B** *1/00;* **E04C** *1/30*

U.S. Cl. 52—275 **34 Claims**



1. A single-walled prefabricated panel module interconnectable with other panel modules in side-to-side right angular relationships without intermediate structural elements for use in constructing interior walls and enclosures comprising a substantially rectangular frame assembly, said frame assembly including oppositely disposed substantially similar third and fourth side framing portions positioned transverse to and connecting said first and second side frame portions, all of said framing portions having a rectangular cross-section and front, rear, and outer side surfaces, a substantially flat sheet of sheathing material having side edges defining a substantially rectangular shape attached to said frame assembly, each of said framing portions having a respective side edge of said sheathing material associated therewith, said sheathing material being so attached to said frame assembly to engage the front surface of each framing portion and to at least partially overlap the front surface of said first framing portion along its length, said sheathing material projecting beyond outer side surfaces of the remaining framing portions of said frame assembly to form overhangs therealong, said overhangs projecting beyond said frame assembly a distance less than the width of said first framing portion and less than the depth of said third framing portion, said subject panel module adapted to be interconnectable with a like module wherein the rear surface of said first framing portion of said subject panel module is placed in abutment with the outer side surface of the second framing portion of a like module and the overhang associated with the second framing portion of the like module abuts and at least partially overlaps said outer side surface of said first framing portion of said subject panel module along the length of said first framing portion, and means for connecting said first framing portion of said subject panel module to the second framing portion of a like module.

4,228,627
REINFORCED FOUNDATION STRUCTURE

Joseph C. O'Neill, 3101 E. Steger Rd., Chicago Heights, Ill. 60411

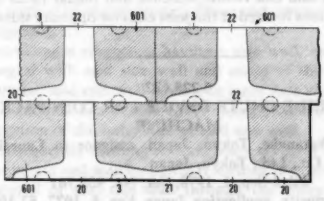
Filed Apr. 16, 1979, Ser. No. 30,343
Int. Cl.[2] E02D 27/42; E04B 1/41
U.S. Cl. 52—295 6 Claims

1. A reinforced foundation structure in the form of a concrete column adapted as a support for a relatively high standing light pole or the like, said foundation structure comprising one or more reinforcing rod assemblies embedded in concrete which forms the main body of the columnar structure, said rod assembly comprising a lowermost section of steel reinforcing rod material and constituting a substantial portion of the length of the rod assembly and an uppermost section of a rod material which has a tensile strength and resistance to shear stress substantially greater than the material of the lowermost rod section, said rod sections being joined by a coupling member which connects the rod sections in axial alignment.

4,228,628
BUILDING BLOCKS AND CONNECTOR MEANS THEREFOR

Kriemhild Schlomann, Seilerstr. 33, Soltau, Fed. Rep. of Germany (D-3040)

Continuation of Ser. No. 850,026, Nov. 9, 1977, abandoned. This application Sep. 1, 1978, Ser. No. 939,132
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651182
Int. Cl.[2] E04B 2/20
U.S. Cl. 52—438 24 Claims

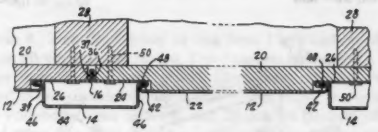


1. In a masonwork, a combination comprising a first and a superimposed second building block, said blocks having neighboring surfaces at least one of which has a recess, and registering sockets in said surfaces; a substantially spherical connector having first and second substantially hemispherical sections which are respectively complementary to and are received in the sockets of said first and second blocks, the weight of said second block being taken up by the surface of said first block; a substantially funnel-shaped inlet in the building block including said one surface for admission of bonding agent into said recess, said inlet extending from said recess to that surface of the respective block which is located opposite said one surface; and hardenable bonding agent filling said recess.

4,228,629
VERTICAL SIDING SYSTEM

Alexander A. Chalmers, Warren; J. Lynn Gailey, Newton Falls; James A. Englund, and Stephen Popek, both of Warren, all of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed May 26, 1978, Ser. No. 909,937
Int. Cl.[3] E04C 1/34
U.S. Cl. 52—460 5 Claims



1. A vertical siding system mounted on a supporting wall, said system comprising:

(a) a plurality of vertically elongated siding panels having longitudinal edges, disposed in parallel, edge-abutting, side-by-side array outwardly of said wall;

(b) for each of said panels, a plurality of fastening elements for securing the panel to the wall; and

(c) a plurality of vertically elongated, resiliently deformable cover members respectively disposed outwardly of the abutting edges of adjacent panels of said array in covering relation to said abutting edges;

(d) each of said panels comprising a unitary, formed sheet metal strip and a substantially rigid insulating body disposed inwardly thereof, both the strip and the body extending over the full width of the panel, each said panel having

(i) a broad central portion with a substantially flat outer surface, extending the length of the panel,

(ii) first and second fastening flanges respectively extending the length of the panel along said longitudinal edges on opposite sides of said central portion, said fastening flanges having outer surfaces offset inwardly with respect to the outer surface of said central portion, said fastening elements for each said panel extending through the fastening flanges thereof into the wall, and

(iii) portions defining first and second locking grooves formed in the sheet metal strip and respectively extending the length of the panel on opposite sides of said central portion between and central portion and said fastening flanges, said locking grooves respectively opening laterally of said panel in opposite directions away from said central portion such that locking grooves of adjacent panels face each other across the abutting edges of the panels;

(e) each of said cover members comprising a formed sheet metal strip having a pair of longitudinal locking flanges, respectively projecting laterally of the cover member in opposite directions and positioned and dimensioned such that they are re-respectively received in the facing locking grooves of adjacent panels mounted on the wall, thereby to retain the cover member in covering relation to the abutting edges and adjacent fastening flanges of the adjacent panels;

(f) each of said cover members being resiliently deformable and being shaped and dimensioned for snap-fitting interengagement of the cover member with facing groove-defining portions of adjacent panels such that the cover member is capable of being deformed for lateral insertion of its locking flanges into the facing grooves of the adjacent

panels and is held under compression between the last-mentioned groove-defining portions;

(g) said panel strip having longitudinal edges bent inwardly at right angles to said fastening flanges to cover the longitudinal edges of said insulating body.

4,228,630

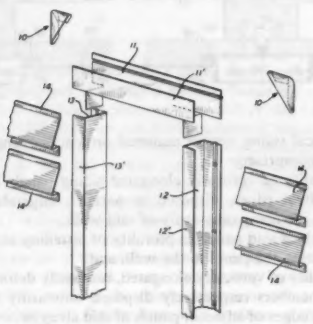
WINDOW FRAME CONSTRUCTION

Herbert U. Englert, Deal, and Jack Demray, Atlantic Highlands, both of N.J., assignors to Englert Metals Corp., Perth Amboy, N.J.

Continuation of Ser. No. 704,179, Jul. 12, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,526

Int. Cl.[2] E04C *2/38;* **E06B** *3/00*

U.S. Cl. 52—656 **1 Claim**



1. A window frame, comprising:

(a) a top bar having opposite ends,

(b) a pair of side bars abutting the top bar ends, forming, therewith, two top window frame corners of an inverted U-shaped window frame configuration,

(c) a pair of plates,

(d) each plate including a triangular side wall portion telescopically registrable with and covering the abutting ends of the top and side bars,

(e) each plate further including a pair of flanged portions bent angularly from two adjacent edges of the side wall portion and each disposed at right angles thereto,

(f) each plate further including a pair of spaced trapezoidal gripping portions, bent angularly beyond the flanged portion and parallel to the side wall portion and defining therewith a Y-shaped slot receiving said abutting corner of the top bar and side bar,

(g) each plate further including a plurality of parallel spaced elongated indentations formed in each of said gripping portions, parallel with flanged portion of the plate from which such gripping portion depends, and spaced therefrom and frictionally engageable with and covering said abutting portions of the top and side bar,

(h) said indentations reinforcing said top and side bars.

4,228,631

HOLLOW RECTANGULAR JOIST

Bruce T. Geffe, 18517 NE. 20th Pl., Redmond, Wash. 98052

Filed Sep. 12, 1978, Ser. No. 941,552

Int. Cl.[3] E04C *3/08, 3/16*

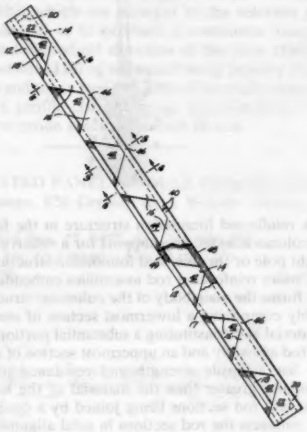
U.S. Cl. 52—690 **8 Claims**

1. A structural wooden joist-like member comprising:

(a) an elongated substantially rectangular tension chord;

(b) an elongated substantially rectangular compression chord in a spaced apart generally parallel opposed relation to said tension chord;

(c) a pair of elongated side members each including a number of planar dentations connecting both side edges of the tension chord to the respective side edges of the compression chord, said dentations each having two non-parallel side edges resulting in each dentation having a broad end and a narrow end; said dentations being serially connected to provide a planar face connected with the side edge of the compression chord and thereby materially increasing its transverse cross-section; the narrow ends of the said dentations being connected with the side edge of the tension chord; and the connections of said dentated side members to the tension and compression chords creating a joist having a substantially hollow rectangular cross-sectional shape in which the compression chord has a greater cross-section than the tension chord; the said dentations forming one side of the said hollow joist being coordinately disposed with dentations forming the opposite side of the joist providing through passages permitting wiring,



pipes, conduit, ducts or other apparatus to extend transversely through the resulting joist openings;

(d) end reinforcements connected face-to-face with said tension chord at each end thereof; said end reinforcements being between the tension chord and the compression chord; said end reinforcements being at each end of the joist extending inward from the end of the joist so that each side edge of each end reinforcement is connected to the said connected planar face of at least two of the dentations; and

(e) upright spacers at each end of the joist, said spacers being connected to the adjoining faces of the said compression chord, said end reinforcements, and planar faces of both dentations located at the joist ends on opposite sides of the joist.

4,228,632

COIN GUIDE CHUTE DEVICE FOR COIN PACKING MACHINE

Kenkichi Watanabe, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1978, Ser. No. 938,781

Claims priority, application Japan, Sep. 6, 1977, 52-107131

Int. Cl.[2] B65B *29/00*

U.S. Cl. 53—54 **2 Claims**

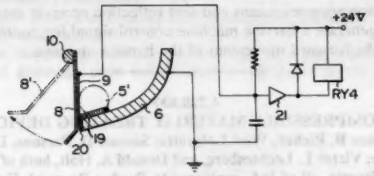
1. In a coin packaging machine including means for winding packaging paper upon the circumferences of a preset number of accumulated coins, and fastening means for folding inwardly both ends of the wound packaging paper to fasten the same, whereby to prepare a coin package;

a coin guide chute device comprising:

guide chute means including a discharge opening for guiding the coin package from the coin packaging means,

said guide chute means including an electrically conductive portion,

gate means of an insulating material hinged to the discharge opening of said guide chute means and biased for closing said discharge opening so as to block said coin package



guided thereto, said gate means including an electrode portion; and

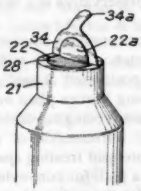
control means for detecting electric conduction between said guide chute means and said electrode portion of said gate means when a loose coin is blocked at the discharge opening of said guide chute means by said gate means.

4,228,633

METHOD FOR MANUFACTURING, FILLING AND CLOSING A RECEPTACLE MADE OF THERMOPLASTIC MATERIAL

Yves J. Corbic, Chatou, France, assignor to Gatrun Anstalt, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 704,730, Jul. 12, 1976, Pat. No. 4,131,211. This application Mar. 13, 1978, Ser. No. 886,093
Claims priority, application France, Mar. 15, 1976, 77 07706
Int. Cl.³ B65B *61/18*
U.S. Cl. 53—412 **13 Claims**



11. A method of manufacturing, filling and closing a receptacle comprising:

(a) providing a receptacle having a side wall, an end wall integral with said side wall and made of thermoplastic material, said end wall having an inner face and an outer face and non-heat fusible cover means attached to at least a portion of the outer face of said end wall;

(b) subsequently forming at least one curved or polygonal slot in said end wall by partially melting the thermoplastic material of said end wall through the entire thickness thereof, by applying on said inner face a heated electrode introduced into said receptacle through a filling opening opposite said end wall, said slot having edges in the form of flanges of substantially rounded section, at least a zone of said end wall surrounded by said slot and a part of said end wall surrounding said slot being hermetically fast with said cover means;

(c) filling said receptacle through said filling opening opposite said end wall provided with said at least one slot; and

(d) hermetically closing said filling opening.

4,228,634

ENVELOPE OPENING PROCESS AND COMPOSITION

Joseph Savit, Glencoe, Ill., assignor to AES Technology Systems, Inc., Elk Grove Village, Ill.

Filed Aug. 13, 1979, Ser. No. 65,908
Int. Cl.³ B65B *43/26, 69/00*
U.S. Cl. 53—492 **8 Claims**

1. In the process for opening envelopes made of cellulosic paper in which a chemical degradation agent for cellulose in aqueous solution is applied to at least one edge of said envelopes, said edge is thereafter heated and subjected to mild mechanical action, the improvement wherein said aqueous solution contains from about 2.5 to about 30 volume percent of a glycol ether of the formula

$$R_1(OR_2)_nOH$$

wherein R_1 is an alkyl group having from 1 to 4 carbon atoms, R_2 is an alkylene group having 2 to 3 carbon atoms and n is an integer from 1 to 2, said glycol ether being capable, when applied to one surface of a sheet of envelope paper in a solution of 80 volume percent of water and 20 volume percent of said glycol ether in a drop of 0.05 ml. size at ambient temperature, of penetrating to the opposite surface within one minute without spreading on said one surface to an area having a diameter in excess of 10 millimeters, said envelope paper being of White Wove starch-sized envelope stock having a moisture content of about 5%, having a basic weight of 22±2 pounds per 3000 square feet and a caliper of 0.0045±0.0005 inches.

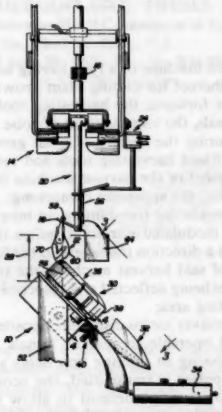
7. A composition for the chemical degradation of paper comprising tartaric acid at a concentration between about 0.5 normal and 7 normal dissolved in a solvent comprising from about 15 to about 30 volume percent of ethylene glycol monoethyl ether and from about 70 to about 85 volume percent of water.

4,228,635

POULTRY BAGGING SYSTEM

William F. Altenpohl, and Paul J. Altenpohl, both of High Point, N.C., assignors to W. F. Altenpohl, Inc., High Point, N.C.

Continuation-in-part of Ser. No. 845,231, Oct. 25, 1977. This application Jan. 10, 1979, Ser. No. 2,705
Int. Cl.³ B65B *43/36, 39/02*
U.S. Cl. 53—572 **16 Claims**



1. In combination with a bagging device having a fixed slide surface adapted to guide movement of a product into an opened bag with a tight fit, and a carrier releasably suspending the product during travel along a conveyor path overlying the slide surface, the improvement residing in hook means for suspending the product on the carrier at two suspension points,

means mounting the hook means on the carrier for pivotal displacement, release means engageable with the hook means for effecting gravity induced displacement thereof to a release position causing free fall of the product along a vertical path to an impact position on said slide surface, and frame means mounting the bagging device in operative relative to the carrier with the slide surface positioned at an angle of incline to said vertical path substantially matching the impact position for terminating said free fall of the product and guiding continued descent thereof into the opened bag.

4,228,636

METHOD AND APPARATUS FOR THE MEASUREMENT OF PLANT DENSITY FOR THE CONTROL OF HARVEST MACHINES

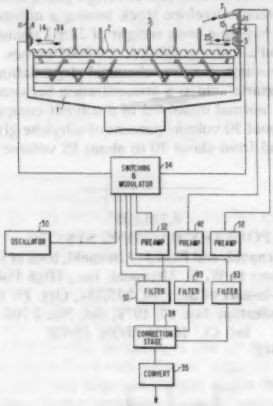
Helmut Homburg, Harsewinkel, Fed. Rep. of Germany, assignor to Firma Gebr. Class Maschinenfabrik GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 770,126, Feb. 18, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,592

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608049

Int. Cl.³ A01D *45/00, 75/02*

U.S. Cl. 56—10.2 **9 Claims**



1. In a harvest machine of a type having harvesting tools at the front end thereof for cutting plant growth as the harvest machine moves forward, the harvesting tools emitting ultrasonic noise signals, the improvement of noise insensitive apparatus for measuring the density of plant growth in a cutting area in front of said harvesting tools and for controlling the forward movement of the harvest machine is response to the measured density, the apparatus comprising:

transmitter means for transmitting an intermittent beam of frequency modulated ultrasonic pulses through said cutting area in a direction transverse to the forward direction of travel of said harvest machine, the transmitted ultrasonic pulses being deflected and absorbed by plant growth in said cutting area;

absorption receiver means disposed opposite said transmitter means and operable to receive signals for a particular period following an acoustic time delay after each of said ultrasonic pulses is transmitted, the acoustic time delay and particular period defined to allow said receiver to receive the ultrasonic signal pulses of said transmitter means that pass through the plant growth in the cutting area;

means for subtracting the noise signals generated during each particular period from the signals received by said receiver means during the particular period;

reflection receiver means disposed forwardly and in a lateral spaced relation with respect to said absorption receiver means for receiving the ultrasonic pulses of said transmitter means that are reflected by the plant growth in said cutting area out of a transverse line between the transmitter means and the absorption receiver means; and

means for evaluating the intensity, time delay and/or phase position of the ultrasonic pulses received by said absorption receiver means and said reflection receiver means to generate a harvest machine control signal for controlling the forward movement of the harvest machine.

4,228,637

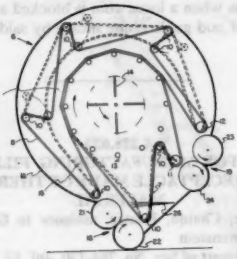
COMPRESSIBLE MATERIAL TREATING DEVICE

Clarence B. Richey, West Lafayette; Samuel D. Parsons, Lafayette; Victor L. Lechtenberg, and Donald A. Holt, both of West Lafayette, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 15, 1978, Ser. No. 905,862

Int. Cl.³ A01D *39/00*; A23K *1/00*

U.S. Cl. 56—341 **27 Claims**



1. A device for treating fibrous plant materials, said device comprising:

housing means providing a treating space that is closed except for an inlet and an outlet;

means to supply a preservative as a treating substance to said treating space;

propelling means for creating a continuously moving flow of said treating substance through said treating area;

first roller means positioned at said inlet of said housing means for receiving fibrous plant materials to be treated, said first roller means being movable and closing said inlet except to permit introduction of said received fibrous plant materials into said treating space;

means establishing a path for conveying fibrous plant material from said inlet through said treating space and into contact with said treating substance within said treating space whereby said fibrous plant material is substantially treated by contact with said treating substance while in said treating space; and

second roller means positioned at said outlet of said housing means for receiving treated fibrous plant material, said second roller means being movable and closing said outlet except to permit discharge of received treated fibrous plant material from said treating space.

4,228,638

PRESERVATIVE APPLICATOR FOR A ROUND BALER

David L. Rabe, Ottumwa, Iowa; Colin M. Hudson, Moline, Ill., and Gust Soteropulos, Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 26, 1978, Ser. No. 955,021

Int. Cl.³ A01D *39/00, 75/00*

U.S. Cl. 56—341 **31 Claims**

1. In a mobile machine for forming large cylindrical bales, having a conveying system including a generally fore-and-aft

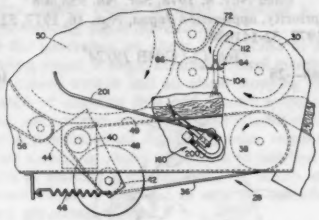
extending conveyor with an upper surface and a bale-forming mechanism for forming cylindrical bales with an axis transverse the conveyor and a forward pickup for lifting crop material from a field and transferring it to the upper surface of the conveyor as a transversely extending mat for rearward movement and delivery to the bale-forming mechanism so that the mat is rolled into a bale by the bale-forming mechanism, the improvement comprising:

a source of crop treating fluid operatively associated with the machine;

fluid dispensing means on the machine, including a plurality of dispenser units independently responsive to the presence of crop material in the mat immediately adjacent the respective dispenser unit for dispensing fluid upwards through the conveyor upper surface over substantially the transverse extent of the mat while it is being carried by the conveyor and immediately before delivery to the bale-forming mechanism;

means for conducting the crop-treating fluid from the source to the dispensing means; and

control means operatively associated with the dispenser units for sensing the presence of crop material on the upper surface of the conveyor and controlling the dispenser units so that fluid is dispensed only when material is present on the conveyor.



4,228,639

PRODUCTION OF YARN

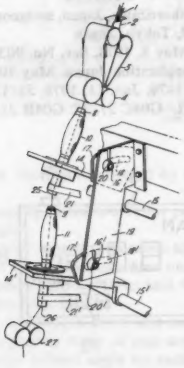
Robert J. Hunt, Lisburn, and Norman A. Hill, Belfast, both of Ireland, assignors to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Jul. 9, 1979, Ser. No. 55,810

Claims priority, application United Kingdom, Jul. 19, 1978, 30288/78

Int. Cl.³ D01H *7/88, 7/92;* D02G *3/38*

U.S. Cl. 57—16 **16 Claims**



1. A method of producing core yarn wrapped with at least two separate wrapper yarns, comprising the steps of passing core material along a path passing in succession through a plurality of rotary hollow spindles, each spindle having an entrance and an exit, wrapping said core material with at least two wrapper yarns withdrawn from packages carried by respective rotary spindles, said wrapping resulting from rotation of said respective spindle, and causing said path of said core material between a point just before said entrance of the first spindle and said exit of the last spindle to deviate from a straight line in such a way that said material engages a rotary end of at least one of said spindles, whereby to apply false twist.

4,228,640

SIMULATED SPUN-LIKE INGRAIN YARN

James R. Talbot, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 839,955, Oct. 6, 1977, Pat. No. 4,164,117, which is a continuation-in-part of Ser. No. 674,350, Apr. 7, 1976, Pat. No. 4,060,970. This application Feb. 1, 1979, Ser. No. 8,640

Int. Cl.³ D02G *3/34, 1/20*

U.S. Cl. 57—208 **8 Claims**

1. A continuous filament spun-like ingrain yarn comprising at least two differently dyeable multifilament synthetic yarns intimately mixed together into a single composite yarn wherein individual filaments are longitudinally in a helical configuration with periodic reversals of extended helix direction along their length, said individual filaments additionally having torque induced kinks and twisted loops in random distribution along the length of said yarn, said yarn being held together as an integral bundle by the intermingling of the respective individual filaments.

4,228,641

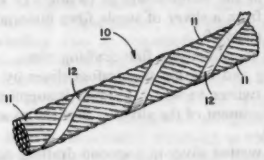
THERMOPLASTIC TWINES

John B. O'Neil, Summerville, S.C., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 28, 1978, Ser. No. 946,888

Int. Cl.³ D02G *3/36*

U.S. Cl. 57—234 **17 Claims**

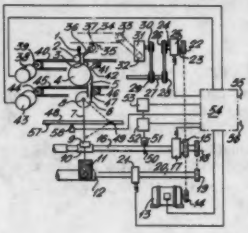


1. A twine comprising a core bundle of continuous synthetic oriented monofilaments extending lengthwise of the twine and twisted so as to contain from 0.3 to about 3.0 turns per linear inch of monofilament twine and a synthetic binder in thin band form made from a material compatible with the monofilaments material, spirally wound in a direction reverse to the core bundle twist, and containing from about 8 to 30 spirals per linear foot of twisted monofilaments, the spirally wound band being adhered to the outer monofilaments along the length of the twisted core bundle.

4,228,642
METHOD AND APPARATUS FOR STOPPING AN OPEN-END SPINNING MACHINE

John Dakin, Rossendale; Dennis O'Donnell, Oldham, and Christopher J. Copple, Billington, nr. Whalley, all of England, assignors to Platt Saco Lowell Limited, Lancashire, England

Filed Nov. 15, 1978, Ser. No. 961,076
Claims priority, application United Kingdom, Nov. 17, 1977, 47802/77
Int. Cl.[3] D01H *1/20, 7/882*
U.S. Cl. 57—263 11 Claims



1. A method of stopping an open-end spinning machine of the type comprising fibre feed means including a fibre feed roller, spinning means for forming a spun yarn from fibres fed thereto from the fibre feed means, and yarn delivery rollers for delivering a yarn formed by the spinning means, including the step of starting to decelerate the fibre feed roller and yarn delivery rollers so that they decelerate in synchronism, wherein the improvement comprises the step of stopping the fibre feed roller after a period of time from the start of the deceleration of the fibre feed roller and yarn delivery rollers and whilst continuing deceleration of the yarn delivery rollers, and then stopping the decelerating yarn delivery rollers a predetermined time after the fibre feed roller.

4,228,643
METHOD FOR THE MANUFACTURE OF TWISTLESS OR SUBSTANTIALLY TWISTLESS YARN

Jan Nijhuis, Hengelo, and Thomas H. M. Terwee, Enschede, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Nov. 24, 1978, Ser. No. 963,544
Claims priority, application Netherlands, Dec. 1, 1977, 7713263; Apr. 7, 1978, 7803705
Int. Cl.[2] D02G *3/40, 3/04;* D01H *13/30*
U.S. Cl. 57—297 6 Claims

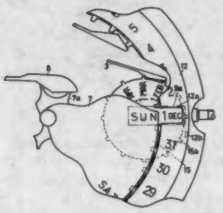
1. Method for the manufacture of twistless or substantially twistless yarn from a sliver of staple fibre material, including the sequential steps of:
dry-drafting the sliver in a first drafting zone,
false twisting and wetting the drafted sliver by means of a first false twister to which a liquid is supplied, whereby the liquid content of the sliver is brought to at least 80% by weight,
drafting the wetted sliver in a second drafting zone to form a thinner fibre strand,
false twisting the fibre strand by means of a second false twister, and
bonding the fibres of the fibre strand.

2. Method for the manufacture of twistless or substantially twistless yarn from a sliver of staple fibre material, including the sequential steps of:
drafting the sliver in a first drafting zone in a dry condition,
false twisting and wetting the drafted sliver by means of a first false twister to which a liquid is supplied sufficient that free liquid remains adhering to the surface of the fibres,
wet drafting the wetted sliver in a second drafting zone to form a thinner fibre strand,
false twisting the fibre strand by means of a second false twister, and
bonding the fibres of the fibre strand.

4,228,644
DISPLAY DEVICE FOR CALENDAR TIMEPIECES

Minoru Watanabe, Tokorozawa, and Munetaka Tamaru, Tokyo, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1978, Ser. No. 958,668
Claims priority, application Japan, Nov. 16, 1977, 52/136732; Nov. 24, 1977, 52-141034
Int. Cl.[3] G04B *19/24*
U.S. Cl. 368—28 16 Claims

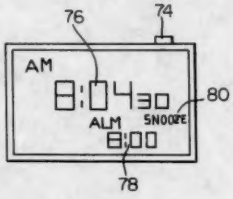


6. A display device for calendar timepieces comprising:
calendar indicating dials including a date dial having date indications and adapted to be rotated one step every 24 hours and a month dial having month indications and adapted to be rotated one step during the rotation of said date dial between the dial indications "31" and "1";
window means for displaying indications on said date dial and said month dial;
means for disclosing the month indication through said window means at a predetermined time, said date dial being positioned above the month dial, said means for disclosing the month indication including an opening provided in said date dial for revealing the month indication at a predetermined time.

4,228,645
ELECTRONIC TIMEPIECE EQUIPPED WITH ALARM SYSTEM

Yasushi Nomura, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed May 8, 1978, Ser. No. 903,475
Claims priority, application Japan, May 10, 1977, 52/53462; Nov. 4, 1977, 52/131474; Jan. 11, 1978, 53/1752
Int. Cl.[3] G04C *21/28;* G04B *23/12*
U.S. Cl. 368—75 11 Claims



1. An electronic timepiece comprising:
a frequency standard providing a relatively high frequency signal;

a frequency divider providing a relatively low frequency signal in response to the relatively high frequency signal;

timekeeping means responsive to said relatively low frequency signal to provide a time information signal;

display means for providing a display of current time in response to said time information signal;

alarm memory means for storing alarm time;

coincidence detection means for detecting a coincidence between the alarm time and the current time to provide a coincidence signal in response thereto;

a coincidence memory circuit for storing said coincidence signal and producing an alarm enabling signal in response thereto;

a snooze control circuit normally operative to pass said alarm enabling signal therethrough;

means for generating an alarm in response to said alarm enabling signal; a single external control member serving as a snooze switch and an alarm stopping switch and adapted to generate first and second switching signals when said external control member is actuated in first and second predetermined actuation modes, respectively;

a snooze switching circuit responsive to said first switching signal to provide a snooze signal by which said snooze control circuit is inhibited to stop the operation of said alarm generating means;

a timer circuit responsive to said snooze signal and said relatively low frequency signal to provide an output when a predetermined time interval has passed after receiving said snooze signal;

said snooze switching circuit being responsive to said output to temporarily inhibit the supply of said snooze signal; and

an alarm stop switching circuit responsive to said second switching signal to provide an alarm stop signal by which said coincidence memory circuit is rendered inoperative to stop the operation said alarm generating means.

4,228,646

ELECTRONIC TIMEPIECE WITH INDICATION DISK FOR INTERNAL STATE OF TIMEPIECE

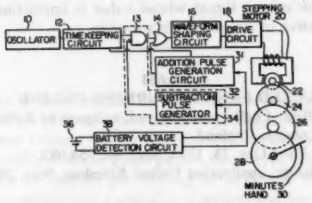
Yoshiaki Kato, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1978, Ser. No. 935,977

Claims priority, application Japan, Aug. 22, 1977, 52/100328

Int. Cl.³ G04C *3/00*

U.S. Cl. 368—66 **18 Claims**



1. An electronic timepiece powered by a battery, comprising:

a standard frequency signal source for providing a standard frequency signal;

timekeeping circuit means responsive to said standard frequency signal for providing a time unit signal;

drive circuit means responsive to said time unit signal for providing first drive pulses;

a stepping motor having a drive coil coupled to said drive circuit means with a rotor of said stepping motor being rotated through a fixed angle by each of said first drive pulses;

time indicating hands driven by said stepping motor for providing a display of time information;

a rotatable display indicia normally driven by said stepping motor in a first operating mode to provide an indication of an internal state of the timepiece;

detection means for detecting a change of said internal state of the timepiece to provide a detection signal in response thereto; and

circuit means for providing an input signal in response to said detection signal and said time unit signal;

said drive circuit means being responsive to said input signal for providing modulated drive pulses by which said stepping motor changes said display indicia to a second operating mode to cause said display indicia to provide an indication of said change of said internal state of the timepiece;

said rotatable display indicia being alternately rotated through a first predetermined angle and held stationary in each of a first set of angular positions when said stepping motor is driven in response to said drive pulses and rotated through a second predetermined angle due to said modulated drive pulses being applied to said stepping motor;

said display indicia comprising an indication member having a plurality of indication patterns on a surface thereof and with each of said indication patterns being situated relative to adjacent indication patterns at angular intervals corresponding to said first predetermined angle.

4,228,647

CLICK MECHANISM OF A TIMEPIECE

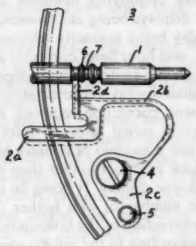
Kenji Yajima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 25, 1978, Ser. No. 909,641

Claims priority, application Japan, Jun. 7, 1977, 52-73755[U]

Int. Cl.³ G04B *27/00, 37/08*

U.S. Cl. 368—185 **2 Claims**



1. In a timepiece having a winding stem mounted for manual axial movement to a plurality of axial operating positions; a click mechanism for said winding stem comprising a plurality of circumferential grooves axially spaced apart along a section of the length of said winding stem; and a detent spring coacting with said winding stem to releasably retain said stem in a manually selected one of said operating positions and enabling manual axial movement of said stem between said operating positions with a click action, said detent spring having an elongate portion extending lengthwise alongside said winding stem in side-by-side relationship therewith as viewed from the front of the timepiece, a detent portion connected to said elongate portion and extending transversely thereof in the sideways direction towards said winding stem to resiliently engage within respective ones of said grooves in dependence upon the axial position of said winding stem to thereby releasably retain said stem in the manually selected operating position and being movable in the sideways direction to disengage from and slide along said grooves due to resilient flexing of said detent spring caused by manual axial movement of said winding stem to thereby enable axial movement of said stem with click action between said operating positions, and an operating portion connected to and extending parallel to said elongate portion and being constrained to move in a predetermined

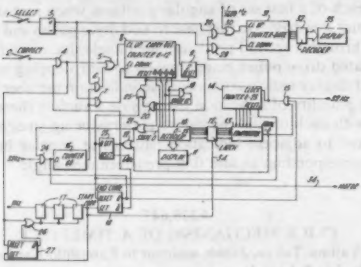
direction by sliding contact with a part of the timepiece thereby constraining said detent portion to move in said sideways direction during flexing of said detent spring caused by axial movement of said winding stem.

4,228,648

HOUR HAND CORRECTOR FOR DUAL DISPLAY TIMEPIECE

Jean-Pierre Jaunin, La Neuveville, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Oct. 11, 1978, Ser. No. 950,354
Int. Cl.[2] G04C *3/00*; G04B *27/00*
U.S. Cl. 368—185 **12 Claims**



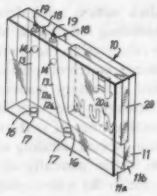
1. An hour hand corrector for use with a timepiece of the type having a first analogue type display including time-indicating hands to display hours and minutes and a second digital type display employing numbers to display further information, both displays being electronically controlled and the analogue display being normally advanced in accordance with elapsed time, said hour hand corrector comprising means including user accessible switch means adapted to enter information into the digital display, representative of the nature and amount of hour hand correction required, means adapted to generate a correction signal after all information has been entered, a switch and a modulo N counter both responsive to said correction signal to direct higher than normal frequency signals to said analogue display, N being an integer which is a submultiple of the number of said higher frequency signals required to effect correction of the hour-indicating hand of the analogue display according to the information entered by said user accessible switch means.

4,228,649

TIMING DEVICE

Gerhart Weiss, 76-70 172nd St., Flushing, N.Y. 11366

Filed Dec. 13, 1978, Ser. No. 969,035
Int. Cl.[2] B04F *1/06*
U.S. Cl. 368—93 **32 Claims**



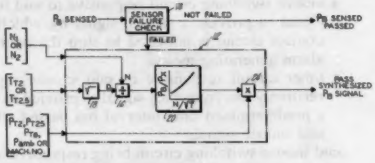
1. A timer, comprising a container having an elongated channel therein, said channel having two closed ends and an axis, a float in said channel, said float being sized to move with clearance from one end of said channel to the other, and a flotation liquid essentially filling said channel with said float therein, said flotation liquid comprising a polydimethylsiloxane oil, having a viscosity between about 5 and 25 centistokes (cs) at room temperature, a mineral oil and a sufficient quantity of a halocarbon having a density of at least 1.5 to yield a selected transit time of said float from one end of said channel to the other when the axis of said channel is in a selected non-horizontal orientation, the relative quantities of said siloxane oil and said mineral oil being such that said transit time is substantially independent of temperature.

4,228,650

SIMULATED PARAMETER CONTROL FOR GAS TURBINE ENGINE

Vann T. Camp, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1978, Ser. No. 901,898
Int. Cl.[3] F02C *9/00*
U.S. Cl. 60—39.09 R **4 Claims**



1. For a fuel control that meters fuel to a gas turbine engine having multiple compressor stages, means for providing a synthesized burner pressure signal to be substituted for a measured parameter indicative of the actual burner pressure in the event of failure of the signal indicative of said measured parameter whenever said signal falls outside the range of its normal operating limits comprising, a function generator responding to a signal indicative of the pressure intermediate said compressor stages which has a relationship to the thermodynamic cycle of said gas turbine engine for generating a first signal indicative of a ratio of two parameters where one of said two parameters is a function of burner pressure to be synthesized, means measuring still a different engine operating parameter which is mutually dependent on the measured parameter processed by said function generator for providing a second signal and means for combining said first signal and said second signal for producing an output signal whose value is approximate the signal indicative of actual burner pressure.

4,228,651

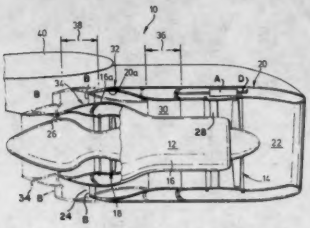
DUCTED FAN GAS TURBINE ENGINE

John A. Mullins, Chellaston, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 24, 1978, Ser. No. 954,082
Claims priority, application United Kingdom, Nov. 29, 1977, 49535/77
Int. Cl.[3] F02K *3/02*
U.S. Cl. 60—226 A **3 Claims**

1. A ducted fan gas turbine engine, comprising a core gas generator enclosed in a streamlined casing, a fan at the upstream end thereof, a cowl surrounding the core gas generator and fan in spaced relationship, so as to form an annular fan duct therewith, the fan duct exit nozzle plane being further upstream than the core gas generator exit nozzle plane, the downstream end portions of both the cowl and the casing being adapted for simultaneous translation to open respective gaps therein, the gap so formed in the casing being within the translatable portion of the cowl, the inner wall of the translatable portion of the cowl and the fixed casing portion being shaped so that on translation of said cowl and casing portions in a downstream direction during operation of said engine, said inner wall of the cowl portion and fixed casing portion cooperate to substantially reduce the fan duct annulus downstream of

the gap in the cowl and, hot gases passing from the core gas generator via the gap in the casing complete the closure



thereof, to prevent fan air from passing therethrough and means for effecting said translation.

4,228,652

EXHAUST NOZZLE FOR JET ENGINES

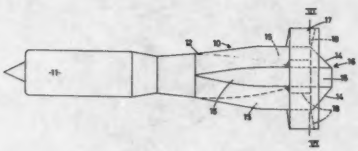
Allen E. Short, Frankton Rd., No. 1 R.D.,, Cromwell, New Zealand

Filed May 5, 1978, Ser. No. 903,337

Claims priority, application New Zealand, May 6, 1977, 184028

Int. Cl.³ F02K 3/10

U.S. Cl. 60—263 **9 Claims**



1. An exhaust nozzle for a jet engine having an exposed external peripheral surface and comprising an outlet section to discharge exhaust gas to the atmosphere; an inlet section of substantially circular cross section to receive the exhaust gas from the jet engine; partitioning in the nozzle which divides the inlet section into a plurality of sectors and forms a plurality of exhaust ducts having a sectorial cross section and flat inwardly projecting side walls, which ducts extend rearwardly from a contiguous position proximate the inlet section such that adjacent ducts have a contiguous common radial wall, to a position at the outlet section such that the ducts diverge outwardly with respect to one another and to the central longitudinal axis of the nozzle; a free air channel formed in the outer surface of the nozzle between each adjacent pair of exhaust ducts, each channel having inwardly projecting side walls formed in part by the opposing flat side walls of an adjacent pair of exhaust ducts, each channel extending to the nozzle outlet and being open ended thereat, and each channel beginning as a shallow groove at a point proximate the inlet section and gradually increasing in width and depth in the direction of the outlet section so as to form a plurality of paths of air flowing over the outer surface of the nozzle.

4,228,653

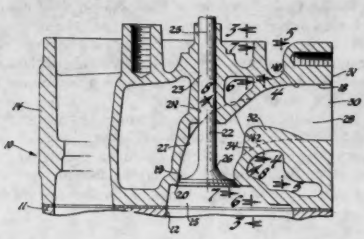
ENGINE CYLINDER EXHAUST PORT

Kenneth D. Sperry, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1979, Ser. No. 21,840

Int. Cl.³ F02F 1/42

U.S. Cl. 60—272 **2 Claims**



1. An internal combustion engine including means defining a cylinder closed at one end, an exhaust port communicating with the cylinder through said closed end and a poppet exhaust valve disposed in the port and having head and stem portions reciprocable on an axis for controlling communication of the exhaust port with the cylinder, said exhaust port being characterized by

a throat portion of generally circular cross section aligned with said axis, said throat portion opening into the cylinder and adapted to be closed by the exhaust valve at the cylinder closed end,

an exit portion having a floor spaced closely to the throat portion and extending at a sharp angle to the direction of the axis, and

a connecting portion smoothly joining the throat and exit portions and including a convexly curved wall portion smoothly connecting said floor with the adjacent part of the throat portion,

said connecting and exit portions having a flow guide comprising a free standing bump laterally centered in and narrower than the floor and adjacent curved wall portion, said bump rising in the direction of airflow away from the cylinder smoothly upward from the curved wall portion to a maximum height near its leading edge at the throat and then curving downward in an extended portion smoothly blended with the port floor whereby the central portion of the gas flow in the sharply curved portion of the port is aided in rounding the curve without turbulence, thereby increasing the capacity for flow of exhaust gas through the port.

4,228,654

HEAT RECUPERATIVE ENGINE WITH IMPROVED RECUPERATOR

Craig C. Hill, Winter St., Lincoln, Mass. 01773

Filed Dec. 7, 1978, Ser. No. 967,384

Int. Cl.³ F02G 1/04

U.S. Cl. 60—508 **3 Claims**

1. In an engine of the type having

(1) compression means for compressing a fluid working medium,

(2) means for heating the compressed fluid working medium, and

(3) work producing means for inducting the compressed heated fluid working medium and producing work by expansion of the working medium,

the improvement of a rotary positive displacement mechanism utilizing the expanded working medium exhausted from the work producing means to heat compressed working medium prior to its induction into the work producing means, the rotary positive displacement mechanism comprising

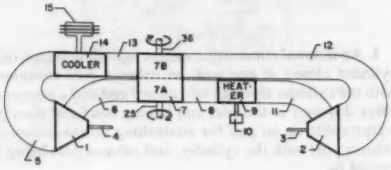
(a) a housing having a first chamber with an inlet port for admitting compressed fluid working medium and an outlet port,

(b) a pair of external spur rotors disposed for rotation in the first chamber, the external spurs being meshed and the rotors extending across the chamber to form a blockage between the inlet and outlet ports,

(c) each of the spur rotors having its external spurs fitting closely with a segment of the chamber wall having embedded heat pipes forming an array around an appreciable extent of the chamber wall, the spaces between adjacent external spurs on a spur rotor providing constant volume enclosures as the external spurs sweep around the closely fitting chamber wall segment,

(d) the housing having a second chamber adjacent to the first chamber, the second chamber having an inlet port for admitting expanded working medium exhausted from the work producing means and having an outlet port,

(e) a second pair of external spur rotors disposed for rotation



in the second chamber, the external spurs of the second pair being meshed and the rotors extending across the second chamber to form a blockage between the inlet and outlet ports,

(f) means for driving the first and second pairs of rotors to cause the first pair of rotors to rotate in directions counter to those of the corresponding rotors of the second pair,

(g) each of the rotors of the second pair having its external spurs fitting closely with a segment of the chamber wall having embedded in it extensions of the heat pipes embedded in the corresponding wall segment of the first chamber, the spaces between adjacent external spurs on a rotor providing constant volume enclosures as the external spurs sweep around the closely fitting wall segment whereby the heat pipes effect recuperative heat exchange between compressed working medium confined in the constant volume enclosures of the rotors in the first chamber and the expanded working medium confined in the constant volume enclosures of the rotors in the second chamber.

4,228,655

INTERNAL COMBUSTION ENGINE AND A METHOD OF OPERATION THEREOF

Otto Herschmann, Bergisch Gladbach; Norbert Zernig, Cologne; Dieter Holthausen, Solingen; Hugo Stock, and Paul Tholen, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

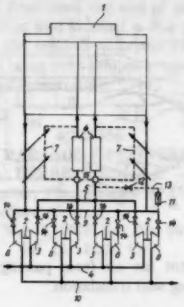
Continuation-in-part of Ser. No. 716,635, Aug. 23, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,185

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1975, 2537863

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—602 **5 Claims**

1. The method of operating an internal combustion engine having working chambers to which fuel and combustion air are supplied and from which exhaust gases are discharged which comprises the steps of: supplying the exhaust gases from said chambers to the inlet sides of a plurality of turbines having blades with each turbine connected to drive a respective compressor, connecting the outlet sides of the compressors with said chambers, interposing gas flow control elements for opening faster than closing in the connections which supply exhaust gases to the inlet sides of said turbines, opening rapidly the control element on the inlet side of a said turbine to start the



turbine, and closing the control element at a rate sutstantially slower than the opening rate thereof when stopping the turbine so that the turbine blades will not be damaged by underpressure vibrations.

4,228,656

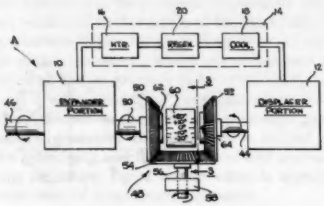
POWER CONTROL FOR HOT GAS ENGINES

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and William F. MacGlashan, Jr., Arcadia, Calif.

Filed May 19, 1978, Ser. No. 907,421

Int. Cl.³ F02G *1/06*

U.S. Cl. 60—518 **25 Claims**



1. In a hot gas engine having a displacer member and an expander member with a displacer shaft section operatively connected to said displacer member and an expander shaft section operatively connected to said expander member, an improved means to control the phase angle between the displacer shaft section and the expander shaft section, said improved means comprising:

(a) a first gear on said displacer shaft section,

(b) a second gear on said expander shaft section,

(c) shiftable gear means including at least one gear in mating engagement with said first gear and mating engagement with said second gear permitting angular changing of the phase angle between said shaft section when said shiftable gear means is moved causing movement of said first and second gears, and

(d) means operatively connected to said shiftable gear means which is manually operable to cause movement of said gear means in an arcuate path having a center point substantially coincident with the axis of each of said crankshafts for changing the phase angle between the shaft sections and the resultant power output of said engine, the amount of arcuate movement of said gear means being selectively determined by the operator of the engine to

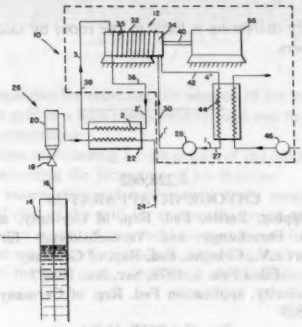
obtain the desired resultant power output so that said last named means can be moved for the selected amount through manual operation by the operator, and where said phase angle can be changed during operation of said engine and rotation of said crankshafts.

4,228,657

REGENERATIVE SCREW EXPANDER

Bruno S. Leo, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 4, 1978, Ser. No. 931,213
Int. Cl.³ F03G *7/00*
U.S. Cl. 60—641 **11 Claims**



1. A regenerative screw expander for use in expanding a thermodynamic fluid stream for extracting work therefrom, said expander comprising:

a housing, intermeshing rotors in said housing for defining space in a fluid path through said housing which expands as said rotors turn within said housing for the expansion of a thermodynamic fluid passing along said path; and

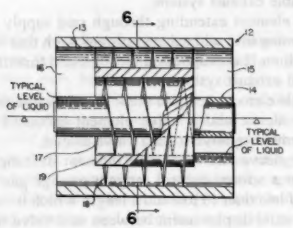
a heat exchanger on said housing for extracting heat from said housing as thermodynamic fluid is expanded as it passes along said path through said housing and for returning the extracted heat to the thermodynamic fluid stream.

4,228,658

METHOD AND APPARATUS FOR CONVERTING PRESSURE INTO ROTATIVE MOTION

Alan E. Belcher, 7 Lakeside Dr., Andover, Conn. 06232

Filed Apr. 24, 1978, Ser. No. 898,703
Claims priority, application United Kingdom, Apr. 29, 1977, 17975/77
Int. Cl.³ F01K *25/06*
U.S. Cl. 60—649 **23 Claims**



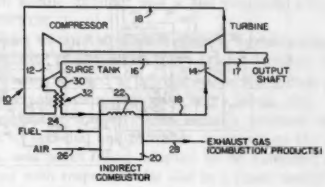
1. A fluid engine comprising at least one coiled conduit having a fluid inlet and a fluid outlet, means supporting said conduit for rotation in one direction about its axis and in a partially immersed condition within a first fluid having an interface with a second fluid of a different fluid density than said first fluid to alternately immerse said fluid inlet in said first and second fluids, and means for maintaining the pressure of the fluid at said fluid outlet below the pressure of the fluid at said inlet whereby to maintain an unbalanced fluid condition within said conduit resulting in a gravitational turning moment about said axis.

4,228,659

GAS TURBINE SYSTEM

Frank E. Lowther, Buffalo, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Continuation-in-part of Ser. No. 879,969, Feb. 21, 1978, and a continuation-in-part of Ser. No. 890,465, Mar. 27, 1978. This application May 22, 1978, Ser. No. 908,155
Int. Cl.³ F01K *25/00*
U.S. Cl. 60—68 Z **5 Claims**



1. A gas turbine engine including a gas compressor, a gas heater, and a gas turbine, all operating in a continuous closed operating gas cycle,

said gas heater being a heat exchanger and having a combustion chamber for burning fuel and generating heat, and a gas conduit to convey said operating gas in heat exchange relationship through said combustion chamber to absorb heat therefrom,

means to cycle the operation of said gas heater in an alternate and regular burn and non-burn operation cycle whereby said operating gas absorbs heat from said combustion chamber during the burn phase of said cycle and said operating gas absorbs heat from said gas turbine during the non-burn phase of said cycle, said operating cycle being so proportioned as to the relative lengths of said burn phase and said non-burn phase that the blades of said gas turbine do not soak to the temperature of said operating gas during said burn phase.

4,228,660

HEAT EXCHANGERS

Maurice Grenier, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

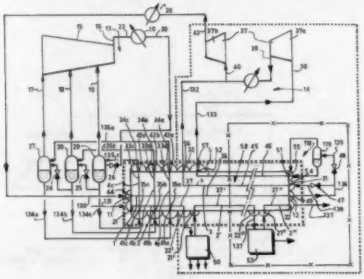
Division of Ser. No. 885,112, Mar. 10, 1978, Pat. No. 4,181,174. This application May 1, 1979, Ser. No. 34,942
Claims priority, application France, Mar. 16, 1977, 77 07777
Int. Cl.³ F25B *7/00*
U.S. Cl. 62—79 **3 Claims**

1. In a method of cooling a gas, consisting of a sequence of at least two cooling cycles which are associated with one another in cascade, of the kind in which:

(a) in the first cycle, cyclically and successively, an auxiliary

refrigerant is compressed to a high pressure, the compressed auxiliary refrigerant is condensed by heat exchange with an external refrigerant, at least a part of the condensed auxiliary refrigerant is expanded to a pressure lower than the said high pressure, at least a portion of the auxiliary refrigerant so expanded is evaporated at the said lower pressure by heat exchange with the refrigerant mixture in the second cycle and the gas to be cooled, in course of cooling, and at least the said evaporated portion of the auxiliary refrigerant is re-compressed to the high pressure,

(b) in the second cycle, cyclically and successively, the refrigerant mixture, comprising at least two C_1 and C_2 hydrocarbons, and possibly nitrogen, is compressed to an upper pressure, the compressed refrigerant mixture is cooled by heat exchange with at least the said portion of auxiliary mixture in course of evaporation at the said



lower pressure, at least a part of the cooled refrigerant mixture is expanded to an evaporation pressure lower than the said upper pressure, at least a portion of the refrigerant mixture so expanded is heated at the said evaporation pressure by heat exchange with at least the refrigerant mixture which is continuing its cooling and at least the said heated portion of the regrigerant mixture is re-compressed to the upper pressure,

the invention which consists in that the refrigerant mixture flows through the exchanger passage as a series of uninterrupted parallel streams of fluid between an upstream zone where the fluid in the vapour state and a downstream zone where the said fluid is in the liquid state, the said first cooling cycle operating to bring about the beginning of a progressive condensation, while the said second cooling cycle operates to bring about at least the end of the said progressive condensation.

4,228,661

METHOD AND APPARATUS FOR REDISTRIBUTING HEAT WITHIN A ROOM

Siegfried Vinz, Neuwiesenrebenstr. 44, D-7505 Ettlingen, Fed. Rep. of Germany

Filed Sep. 27, 1977, Ser. No. 836,962

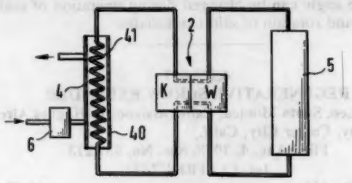
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644372

Int. Cl.³ F24B *13/00*

U.S. Cl. 62—89 **15 Claims**

1. A method of redistributing heat within a room by employing at least one heat pump which is adapted to obtain heat on an expansion side from a supply of heat and to deliver such heat on its compression side to a medium to be heated, comprising the steps of:

recirculating the air of the room through channels between boundary surfaces of the room and radiation members disposed adjacent said boundary surfaces back into the room, and removing heat exclusively from the recirculating air of the room with said heat pump and simulta-



neously delivering it back to the room by said radiation members.

4,228,662

CRYOGENIC APPARATUS

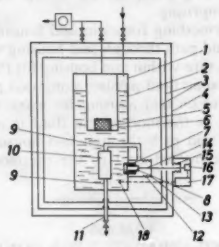
Gustav Klipping, Berlin, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luftund Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 10,677

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806829

Int. Cl.³ F25B *41/04*

U.S. Cl. 62—216 **12 Claims**



1. A cryogenic apparatus for cooling objects to and maintaining them at very low temperatures by the evaporation of superfluid helium II using confinement produced by the thermomechanical effect, said apparatus comprising:

a supply container containing therein a supply of superfluid helium II;

an evacuable exhaust system;

a throttle element extending through said supply container and opening into said exhaust system, such that said superfluid helium II is evaporated through said throttle element into said exhaust system;

said throttle element being in the form of a valve comprising a valve sleeve and a valve element mounted for axial displacement relative to said valve sleeve;

said valve sleeve and said valve element defining therebetween in a normal control range a passage gap having a width of less than 10 μm and a length which is variable by relative axial displacement between said valve sleeve and said valve element; and

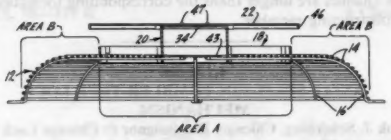
control means, connected to said valve element, for controlling the relative axial position of said valve element with respect to said valve sleeve and for thereby controlling the evaporation of said superfluid helium II through said throttle element into said exhaust system.

4,228,663

APPARATUS FOR REDUCING ICE BUILD-UP ON A DISCHARGE GRILL OF A HEAT PUMP OUTDOOR UNIT

Joseph F. Picarello, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 13, 1979, Ser. No. 57,487
Int. Cl.[3] F25B 39/04
U.S. Cl. 62—507 10 Claims



1. An apparatus for reducing the amount of ice build-up on a discharge grill of a heat pump outdoor unit and the like, said apparatus comprising:

body means surrounding a central part of the discharge grill for preventing the formation of ice thereon;

support means disposed within said body means over a central disc of the grill for supporting cover means; and

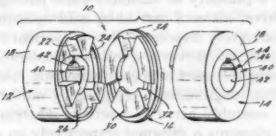
cover means mounted upon said support means for preventing the entrance of rain, sleet or the like onto the central area of the grill so as to minimize the formation of ice.

4,228,664

FLEXIBLE DRIVE COUPLING

Christopher B. McCoy, Alpena, Mich., assignor to Douville-Johnston Corporation, Alpena, Mich.

Filed Nov. 8, 1978, Ser. No. 959,089
Int. Cl.[3] F16D 3/64
U.S. Cl. 64—14 12 Claims



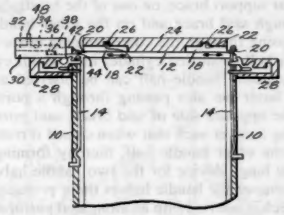
1. In a drive coupling for transmitting rotational energy from a driving shaft to a driven shaft including a pair of coupling members each having a plurality of drive lugs and a coupling element disposed intermediate said coupling members for transmitting rotational energy from the coupling member disposed on said driving shaft to the coupling member disposed on said driven shaft; an improved means of securing a coupling member to a shaft comprising a substantially epitrochoidal-shaped insert disposed within a similarly shaped bore formed in said coupling member, said insert having a shaft bore formed therein including means for preventing rotation of said insert relative to said shaft, and a narrow gap formed in one wall of said insert for permitting said insert to conform to the size of said shaft upon the application of torque from the driving shaft to said insert, thereby preventing axial movement of said coupling member relative to said shaft.

4,228,665

APPARATUS FOR TERRYING YARN

Marius Langlois, Waterloo, Canada, assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 878,724, Feb. 17, 1978, abandoned. This application Dec. 7, 1978, Ser. No. 967,496
Int. Cl.[2] D04B 9/12, 15/02
U.S. Cl. 66—93 3 Claims



1. An apparatus for terrying yarn comprising:

a circular ladies hosiery knitting machine including:

(a) a latch needle cylinder and a dial rotatable about a common axis;

(b) a plurality of latch needles supported by said cylinder and movable therewith as the cylinder rotates, said needles being adapted to be reciprocated in a direction parallel to said axis to knit yarn into a fabric; and

(c) a plurality of transfer jacks radially oriented with respect to said dial and movable therewith as the dial rotates, said jacks being adapted to be extended and retracted with respect to the dial in a plane normal to the direction of reciprocation of said needles, said jacks, when extended, cooperating with the needles to form loops of yarn on the jacks, said loops being movable in a circular path as the jacks rotate with the dial; and

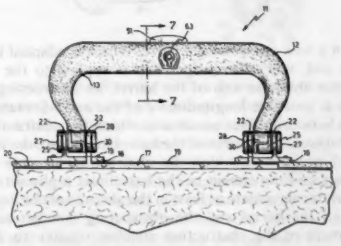
a de-looping arrangement adapted to be moved between operative and inoperative positions, said arrangement in the operative position being located in the path of movement of the loops carried by said extended jacks thereby engaging said loops to separate them from the jacks and said arrangement in the inoperative position being located out of the path of movement of the loops carried by said extended jacks thereby permitting said loops to be knitted into the fabric.

4,228,666

SAFETY LATCHES FOR PORTFOLIOS, BAGS, SUITCASES AND THE LIKE

Domingo Perez-Alonso, Avenida de las Torres No. 178, Zona Industrial Tlatilco, Edo. Mexico

Filed Apr. 2, 1979, Ser. No. 26,395
Int. Cl.[3] E05B 65/52
U.S. Cl. 70—67 4 Claims



1. Improvements in safety closures for cases, bags, valises

and the like, of the kind incorporating a male latch pin which is inserted into a female receptacle under pressure and which can be retained in the closed position by the action of a ratchet mechanism which is incorporated into a joined handle by means of a hinge mechanism on the lid portion of a container such as a suitcase, wherein the handle is divided lengthwise down its middle and each of the handle halves is joined to one of the confronting cover portions of the container by means of a hinge structure comprising a plate secured as with pins to each of the confronting portions of the container and having a perpendicular support brace, on one of the handle halves a pin passing through said brace and on the other handle half another pin passing through the corresponding brace and securing thereto a hollow slotted cylinder into which cylinder the pin of the opposite handle half can be inserted and housed therein, the latter pin also passing through a portion of the handle on the opposite side of said brace, said portion of the handle having a cover such that when closed it rests upon the cylinder of the other handle half, thereby forming between them a single hinge device for the two handle halves; and in which from one of the handle halves there protudes a slotted latch pin which is inserted into an elongated perforation of the other handle half and locks upon the upper edge thereof so long as a button projecting from a slot in the first handle half referred to is not depressed; and in that it likewise includes a pin which extends outward from a perforation in the first handle half and yieldingly presses upon the other handle half when the handle halves are in the closed position, thus taking up any clearance or space between the handle halves in their closed position, and yieldingly pressing one handle half out of contact with the other handle half to facilitate the opening of the suitcase; and in that one of the handle halves includes a keyhole and lock which by means of a key actuates a bar which prevents the button on the handle half from being pressed down and thus maintains the safety closure in closed position locked with the key.

4,228,667

MAGNETICALLY ACTING LOCK AND KEY

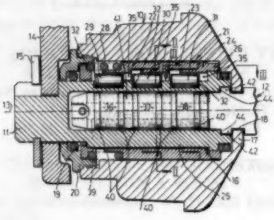
Leslie V. Herriott, Wolverhampton, England, assignor to Lowe and Fletcher Limited, West Midlands, England

Continuation of Ser. No. 778,333, Mar. 16, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,175

Claims priority, application United Kingdom, Mar. 16, 1976, 10416/76; Oct. 6, 1976, 41429/76

Int. Cl.[3] **E05B** *19/26, 27/00, 47/00*

U.S. Cl. 70—276 **9 Claims**



1. In a lock comprising a barrel which is adapted to receive a key and, when the proper key is applied to the barrel, is rotatable about an axis of the barrel, an obstructing member which is movable longitudinally of the axis of rotation of the barrel between a first position in which the obstructing member obstructs movement of the barrel to operate the lock and a second position in which the obstructing member does not obstruct said movement of the barrel and a plurality of magnetic elements which, at least in the absence of the key, engage between the barrel and the obstructing member to prevent movement of the obstructing member relative to the barrel from its first position to its second position, the improvement wherein the magnetic elements are in the form of rolling elements, the barrel has an elongate keyway to receive the key, the obstructing member is in the form of a sleeve and surrounds the barrel, the barrel and the obstructing member collectively define a plurality of channels in which the magnetic elements are disposed and along which the magnetic elements are movable by a magnetic field of the proper key to releasing positions where they permit movement of the obstructing member from its first position to its second position, each of said channels is formed partly in the obstructing member and partly in the barrel and the formations in the barrel which constitute part of each channel are longer thans the corresponding formations in the obstructing member.

4,228,668

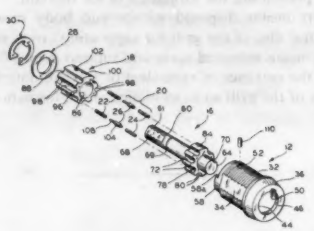
AXIAL SPLIT-PIN TUMBLER-TYPE LOCK MECHANISM

Frank J. Scherbing, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Apr. 19, 1979, Ser. No. 31,435

Int. Cl.[3] **E05B** *27/08*

U.S. Cl. 70—363 **3 Claims**



1. In an axial split-pin tumbler-type lock mechanism including a lock cylinder having front an rear ends and a substantially smooth cylindrical inner wall surface, said inner wall surface having a longitudinal axis extending in a direction from front to rear in the cylinder, a barrel assembly secured within said cylinder and including a forwardly disposed operating part rotatable about said axis and a rearwardly disposed stationary part, said operating and stationary parts each including a portion having an outer surface adjacent to said inner wall surface and said portions adjoining each other at a transverse interfacial plane, a plurality of tumblers each having a forwardly disposed driver element carried by said operating part and a separate rearwardly disposed follower element carried by said stationary part, said driver and follower elements of respective tumblers being disposed in aligned adjoining relation and each tumbler being longitudinally reciprocally movable relative to said barrel assembly between positions wherein the joint between said elements is disposed respectively on opposite sides of said interfacial plane when the operating part is in a selected rotational position relative to the stationary part, said operating part being free to rotate when said joints coincide with said interfacial plane, said driver elements having front ends engageable with a key which when moved rearwardly moves said tumblers into positions wherein said joints coincide with said interfacial plane, and spring means disposed rearwardly of said follower elements to yieldingly urge said tumblers forwardly to positions wherein said interfacial plane is bridged by the follower elements to secure the operating and stationary parts against relative rotation, the improvement wherein said portions of said operating and stationary parts each include means providing a plurality of longitudinal grooves each extending for the full length of the portion in the outer surface thereof and having open opposite ends, said grooves in one portion being aligned respectively with said grooves in the other portion when the operating part is in said selected rotational position, said driver and follower elements being carried

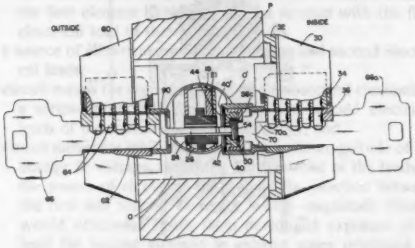
in said grooves, and the lock mechanism also includes discrete means disposed rearwardly of said portion of the stationary part for seating said spring means.

4,228,669

DOUBLE CYLINDER LOCK WITH KEY RETENTION

Daniel R. Bischoff, Grand Rapids, Mich., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Jul. 3, 1978, Ser. No. 921,442
Int. Cl.³ E05B *9/10, 11/00, 17/04*
U.S. Cl. 70—379 R **6 Claims**



6. A double cylinder lock assembly having swivel means for extending and retracting a lock bolt, and interior and exterior rotary key cylinders on opposite sides of said swivel means to extend and retract said lock bolt, said interior key cylinder having key retraction capacity in a particular rotary position with said lock bolt retracted, comprising:

a rotary driver extending from said exterior key cylinder into operative engagement with said swivel means and toward said interior key cylinder; an axially shiftable, rotary clutch between said rotary driver and said interior key cylinder, having a pair of engageable members, and shiftable by a key in said interior key cylinder to engaged condition from a normally disengaged condition; and said clutch being engageable in only one rotational relationship between said members to assure retractability of the key from said interior key cylinder at said particular rotary position with said lock bolt retracted, and prevent retractability of such key at other rotary positions thereof, one of said clutch members comprising a disc engaged by said rotary driver and having a radially offset recess straddled by a pair of abutment surfaces, and the other of said clutch members having a lug which is axially shiftable by a key in said interior key cylinder into drive engagement with said recess, said abutment surfaces being portions of a pair of resilient ears protruding axially from said disc and depressable by said lug against inherent bias for alignment of said lug and said recess.

4,228,670

PROCESS FOR THE ISOTHERMAL FORGING OF A WORK PIECE

Christopher W. Corti, Reading, England; Rolf Lüthi, Fislisbach, and Ernst Vogt, Remigen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 26, 1978, Ser. No. 954,735
Claims priority, application Switzerland, Oct. 26, 1977, 13050/77
Int. Cl.² B21J *3/00*
U.S. Cl. 72—42 **13 Claims**

1. A process for the lubrication of a tool surface which comprises:

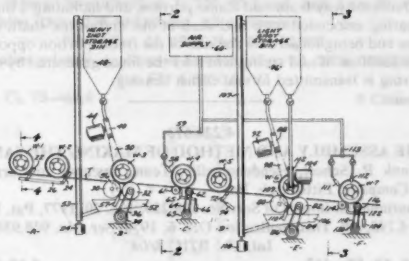
high pressure blast spraying a powder lubricant comprising boron nitrite having a particle size of 0.6 to 1.5μ at a spray pressure of 4 to 5 bar, onto said tool surface thereby producing a high temperature compacted coherent lubricant film on said surface while simultaneously smoothing, strengthening and compressively stressing said tool surface.

4,228,671

PROCESS FOR MAKING A VEHICLE WHEEL

James E. Skeen, Pacific Palisades, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Filed Apr. 2, 1979, Ser. No. 25,788
Int. Cl.³ C21D *7/06*
U.S. Cl. 72—53 **12 Claims**



1. A process for making a vehicle wheel from a casting, having a drop center area and a face area, said process including the steps of:

shot peening the wheel's drop center area to seal any air-transfer holes therein and to also increase the fatigue strength thereof; and

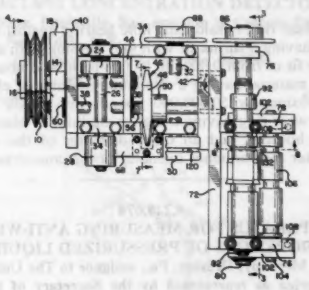
thereafter shot peening both said drop center area and the face area of said wheel with finer shot to thereby reduce the surface roughness of said drop center area and said face area.

4,228,672

ROTARY NOTCHER AND FORMER

Leo R. Gale, Morton Grove, and Robert R. Heilman, Elburn, both of Ill., assignors to The Lockformer Company, Lisle, Ill.

Filed Jun. 5, 1978, Ser. No. 912,509
Int. Cl.³ B21D *5/14*
U.S. Cl. 72—130 **5 Claims**



1. In an apparatus for forming collars from sheet metal, the apparatus having means for producing a plurality of spaced apart notches in the edge of a sheet, and wherein means are provided for advancing the sheet through the apparatus, the improvement in means for forming the notches comprising a rotary tool having at least one end engageable with said sheet, a shaft supporting said tool, and drive means connected to said shaft for rotating the shaft and tool whereby said end is engaged with said sheet, the means for advancing the sheet operating to continually expose unnotched sheet edge portions to said tool whereby new notches are formed as the tool revolves,

and tool stabilizing means engaging said tool during rotation, said stabilizing means comprising a fitting attached to said tool, said fitting being fastened to said tool for rotation therewith, said fitting extending around and along said shaft on at least one side of said tool, a stationary frame portion in spaced relationship with said tool, spring means extending between said frame portion and said tool, securing means holding said tool and associated fitting against axial movement relative to the shaft, said spring means comprising a compression spring positioned around said shaft and having one end bearing against said frame portion and the other end bearing against said tool, said spring means therefore forcing said shaft in a direction away from said frame portion, and including a thrust bearing associated with said shaft at one end of the shaft, said one end being located on the side of the frame portion opposite the location of said spring whereby the force generated by said spring is transmitted to said thrust bearing.

4,228,673

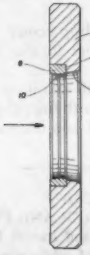
DIE ASSEMBLY AND METHOD OF MAKING THE SAME

Frank R. Scheel, Hendersonville, Tenn., assignor to Carmet Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 808,220, Jun. 20, 1977, Pat. No. 4,145,910. This application Oct. 6, 1978, Ser. No. 948,938

Int. Cl.³ B21C *3/04*

U.S. Cl. 72—467 **5 Claims**



1. A drawing and ironing die assembly comprising

a housing having an axial hole therethrough, and a radial shoulder on the exit side of said housing, provided by means of a counterbore on the entry side of said axial hole, and

a die wear ring in said axial hole bearing against said shoulder having a shrink fit with said housing with an interference fit of from 0.0006 to 0.0008 inch, said housing made of a material having a minimum modulus of elasticity of approximately 50,000,000 pounds per square inch, and said wear ring having a higher modulus of elasticity than said housing, and an outer diameter of the wear ring greater than an inner diameter of the counterbore.

4,228,674

APPARATUS FOR MEASURING ANTI-WEAR PROPERTIES OF PRESSURIZED LIQUIDS

Abraham Mertwoy, Dresher, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 4, 1979, Ser. No. 44,898

Int. Cl.³ G01N *3/56, 19/02*

U.S. Cl. 73—10 **9 Claims**

1. A testing device for determining the lubricity or anti-wear resistance characteristics of hydraulic fluids under elevated fluid pressures and temperatures, comprising:

a housing having an open end and a cavity therein including a continuous passageway for said fluids;

a cover removably mounted on said housing in pressure-tight engagement with said open end;

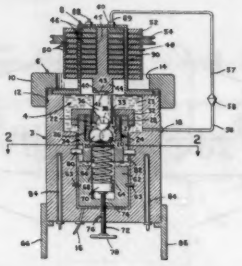
a fluid inlet and a fluid outlet, said fluid inlet connected with said continuous passageway to permit the flow of pressurized fluids in said housing;

a plurality of test balls held stationary within said housing;

an upper ball rotatably mounted in contact with each of said test balls;

a chuck assembly disposed within said cavity adapted to fixedly retain said test balls and to axially reciprocate toward said upper ball;

means for rotatably supporting said upper ball in axial alignment within said test balls;



means associated with said chuck assembly for applying pressure between said test balls and said upper ball which includes;

and adjustable calibrated spring assembly communicating with said chuck assembly and adapted to urge said test balls into pressured contact with said upper ball; and

means associated with said upper ball supporting means for rotating said upper ball in contact with said test balls.

4,228,675

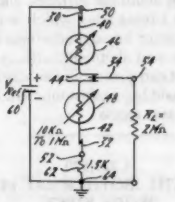
EXHAUST GAS SENSOR ELECTRICAL CIRCUIT IMPROVEMENT

Elmer T. Heiney, III, Huntington Woods, and Stanley R. Merchant, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 22, 1979, Ser. No. 5,422

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—23 **10 Claims**



1. An improved exhaust gas sensor electrical circuit employing a sensor of the type having a first negative-temperature-coefficient variably resistive element adapted to produce an electrical resistance change, as a function of the composition of the exhaust gases produced by the combustion of a rich or lean (with respect to stoichiometry) air/fuel mixture supplied to an internal combustion engine, in a circuit including a second negative-temperature-coefficient variably resistive element that is connected in series with the first variably resistive element, the improved exhaust gas sensor electrical circuit comprising:

the first element being formed from metal oxide ceramic material having spaced first and second electrical leads connected thereto, the metal oxide material having be-

tween the leads connected thereto an electrical resistance that varies both as a function of the temperature of the metal oxide material and as a function of the partial pressure of oxygen in the exhaust gases to which the metal oxide material is exposed;

the second element being formed from metal oxide ceramic material having, as compared to the metal oxide material of the first element, a longer time rate of response to variations in the partial pressure of oxygen in the exhaust gases from an internal combustion engine supplied with an air/fuel mixture changed from rich to lean and vice versa, the second element having spaced first and second electrical leads connected thereto, the second electrical lead of the first element having a junction formed with the first electrical lead of the second element;

a source of electrical energy having first and second electrical leads;

circuit means for connecting the first and second elements in a series-circuit between the first and second electrical leads of the source of electrical energy; and

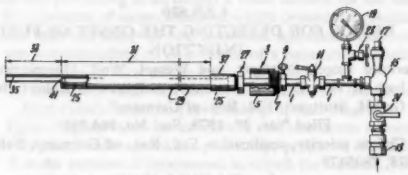
circuit means for inhibiting reduction in the magnitude of the change in voltage, measured between one of the leads of the source of electrical energy and the junction between the first and second elements, which magnitude change would otherwise result from prolonged exposure of at least the second element to exhaust gases produced by combustion of a rich air/fuel mixture prior to change to a lean air/fuel mixture or vice versa.

4,228,676

ASH SAMPLING PROBE

John G. Myers, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 23, 1979, Ser. No. 41,840
Int. Cl.³ G01N *1/04, 1/22*
U.S. Cl. 73—28 **10 Claims**



1. In a probe for sampling ash contained in an ash bearing gas stream located in a wall confined region, said probe comprising

(a) a gas stream withdrawing tube having a first end through which the gas stream bearing ash to be sampled is withdrawn;

(b) a port engaging coupling adjustably mounted around the gas stream withdrawing tube whereby the latter may be moved into a wall confined region containing the ash bearing gas stream through a port in said wall, while maintaining a gastight association between said withdrawing tube and the wall confined region;

(c) means for applying reduced pressure to a second end of the gas stream withdrawing tube, whereby the ash bearing gas stream is caused to move through said tube, and associated with said means, valving means connecting said means for applying reduced pressure to said second end of said withdrawing tube;

the improvement wherein said probe further comprises:

(d) attached to said first end of said gas stream withdrawing tube, a porous closed end tube which permits the ash bearing gas stream to pass therethrough and into said withdrawing tube, while retaining on the outer surface thereof, ash contained in said ash bearing gas stream; and

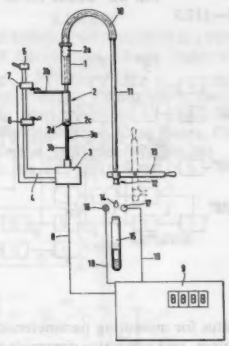
(e) associated with the porous closed end tube, a collecting baffle which directs particles of ash contained in the ash bearing gas stream toward the porous closed end tube.

4,228,677

METHOD AND MEANS FOR MEASURING SURFACE TENSION

Kjell I. Olsson, Eskilstorpsgatan 7, 235 00 Vellinge; Anders E. B. Aberg, Nyckelkroken 3, 222 47 Lund, and Lars O. S. Gislen, Dala, 240 50 Ostraby, all of Sweden

Filed Mar. 22, 1979, Ser. No. 22,903
Claims priority, application Sweden, Mar. 23, 1978, 7803385
Int. Cl.³ G01N *13/02*
U.S. Cl. 73—64.4 **9 Claims**



1. A method of measuring the surface tension of a liquid comprising the steps of:

(a) discharging the liquid from a liquid container by a pump;

(b) forming a drop from the discharged liquid; and

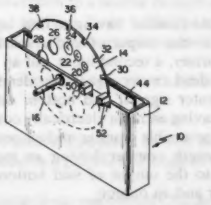
(c) measuring the pump displacement necessary to provide the amount of liquid required for forming the drop.

4,228,678

SURFACTANT CONCENTRATION DETECTOR

Clifton F. Slaton, Louisville, Ky., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 8, 1979, Ser. No. 64,690
Int. Cl.³ G01N *13/02*
U.S. Cl. 73—64.4 **6 Claims**



1. An apparatus for detecting the concentration of a surfactant liquid solution comprising a tank, means for delivering the liquid solution to said tank, a wheel rotatable in said tank, said wheel having a series of progressively larger holes therethrough, said holes being centered on a circle concentric with the axis of rotation of said wheel, said wheel having notches in the periphery thereof corresponding to each of said holes, a portion of said wheel rising out of said tank, first photocell means directed at said wheel for detecting films formed across any of said holes, second photocell means for counting said

notches to time said wheel, and means for slowly rotating said wheel.

4,228,679

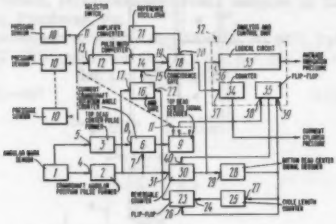
APPARATUS FOR MEASURING PARAMETERS OF WORK DIAGRAM OF PISTON MACHINES

Viktor V. Alt, 3, kv. 13; Alexandr A. Mischenkov, 3, kv. 24; Viktor A. Ponomarev, 6, kv. 192, all of rabochy poselok Krasnoobsk Novosibirskoi oblasti; Eduard L. Avdjushev, ulitsa Petukhova, 80, kv. 12, Novosibirsk; Jury S. Kamynin, 7, kv. 65; Vladimir P. Baryshnikov, 3, kv. 123, both of rabochy poselok Krasnoobsk Novosibirskoi oblasti; Grigory K. Levin, ulitsa Podvoiskogo, 14, korpus 1, kv. 852, and Alexei A. Orlov, ulitsa 3 Internatsionala, 55, kv. 50, both of Leningrad, all of U.S.S.R.

Filed Apr. 10, 1979, Ser. No. 28,899

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117.3 **8 Claims**



1. Apparatus for measuring parameters of work diagram of piston machines, said apparatus comprising

an angular mark sensor having uniformly distributed crankshaft rotation angle marks for one of the piston machines, a top dead center mark, a first output and a second output, the crankshaft rotation angle marks being used for determining top dead center signals and bottom dead center signals;

a crankshaft angular position pulse former having an input electrically connected to the first output of said angular mark sensor and an output;

a top dead center pulse former having an input electrically connected to the second output of said angular mark sensor and an output;

a current crankshaft rotation angle counter having a first input electrically connected to the output of said crankshaft angular position former, a second input electrically connected to the output of said top dead center pulse former and an output;

a reversible counter having a first input electrically connected to the output of said crankshaft angular position pulse former, a second input and an output;

a bottom dead center signal decoder for decoding bottom dead center signals, said bottom dead center signal decoder having an input electrically connected to the output of said reversible counter and an output;

a cycle length counter having an input electrically connected to the output of said bottom dead center signal decoder and an output;

a main flip-flop having a first input electrically connected to the output of said cycle length counter, a second input electrically connected to the output of said bottom dead center signal decoder and an output;

a top dead center signal decoder for decoding top dead center signals, said top dead center signal decoder having an input electrically connected to the output of said current crankshaft rotation angle counter and n outputs;

a selector switch having a first group of inputs among n inputs, a second group of inputs among n inputs, a first output and a second output, one of the inputs of the first group of inputs being coupled to a corresponding one of the n outputs of said top dead center signal decoder;

n pressure sensors in cylinders of piston machines, each having an output coupled to a corresponding one of the n inputs of the second group of inputs of said selector switch;

an amplifier converter for handling a pressure signal of the cylinder of a piston machine, said amplifier converter having an input electrically connected to the second output of said selector switch and an output;

a pulse width converter having a first input electrically connected to the output of said amplifier converter, a second input and an output;

an AND gate having a first input electrically connected to the output of said crankshaft angular position pulse former, a second input, and an output electrically connected to the second input of said pulse width converter;

a main coincidence gate having a first input electrically connected to the output of said pulse width converter, a second input and an output;

a reference oscillator having an output electrically connected to the second input of said main coincidence gate; and

an analysis and control unit having a first input electrically connected to the output of said main coincidence gate, a second input electrically connected to the first output of said selector switch, a third input electrically connected to the output of said reversible counter, a fourth input electrically connected to the output of said bottom dead center signal decoder, and an output electrically connected to the second input of said reversible counter, said analysis and control unit including a logical circuit having a first input which is the third input of said analysis and control unit, a counter having an input which is the first input of said analysis and control unit and a flip-flop having a first input which is the second input of said analysis and control unit, a second input which is the fourth input of said analysis and control unit, and an output which is the output of said analysis and control unit.

4,228,680

DEVICE FOR DETECTING THE ONSET OF FUEL INJECTION

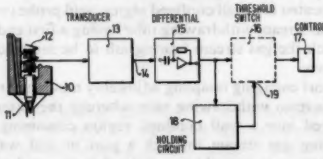
Gerhard Engel, Stuttgart, and Wessel, Wolf, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,846

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805175

Int. Cl.³ G01M *19/00*

U.S. Cl. 73—119 A **9 Claims**



1. A device for detecting the onset of fuel injection in a fuel injection valve of an internal combustion engine including:

a mechanical-electrical transducer associated with said fuel injection valve for generating a first output signal related to the position of the movable valve member in said fuel injection valve, and an electronic processing circuit for processing said signal generated by said transducer, and wherein the improvement comprises a differential circuit connected to said transducer for directly receiving the signal from said transducer and generating therefrom a

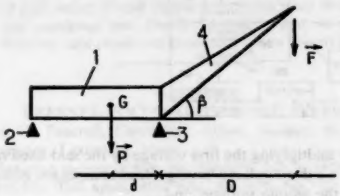
differentiated signal to be applied to said processing circuit.

4,228,681

CRANE LOAD COMPUTER

Roger Pruex, 70, rue Philippe Dartis, 93031 Epinay sur Seine, France

Filed May 8, 1978, Ser. No. 903,745
Claims priority, application France, May 13, 1977, 77 14779
Int. Cl.³ G01L 5/16
U.S. Cl. 73—133 R **6 Claims**



1. Device for checking the loading state of a lifting applicance including a crane having a telescopic jib provided with a hook from which a load is adapted to be suspended, comprising:

a calculation member for determining the weight of the suspended load on the hook of the crane;

memory means including memories storing information derived from diagrams previously prepared, the diagrams providing values of various admissible loads which depend on various values of at least one parameter defining the geometric state of said applicance;

a central unit coupled with said calculation member and said memory means for receiving information relating to the parameters of said crane for determining the maximum admissible load for each of the values stored in said memory means;

said unit producing as an output a value desired for the load by a process of incrementation which consists of dividing the intervals between two maximum admissible load values corresponding to two values of a parameter defining the geometric state of the crane, in which:

C_1 is a lower value for one of said maximum admissible load values from the previously prepared diagrams,

C_2 is a higher value for another of said maximum admissible load values from the previously prepared diagrams,

N is the number of increments in which the values C_2–C_1 is divided.

C_i is a maximum admissible load value falling between said load values C_1 and C_2 for which there is no previously prepared diagram and information stored in said memory,

the value of the maximum admissible load C_i is determined according to the expression:

$$C_i = C_1 + k\frac{C_2 - C_1}{N}$$

in which K is the grade of the increment corresponding to the parameter and whose expression is

$$k = \left(\frac{N(l_i - l_1)}{l_2 - l_1}\right)$$

in which:

l_i is the length of said jib for the load C_i,

l_1 is the length of said jib for the load C_1, and

l_2 is the length of said jib for the load C_2;

said central unit including a comparison means to compare the value of the maximum admissible load of said lifting appliance with the value of the actual suspended load as determined by said calculation member; and,

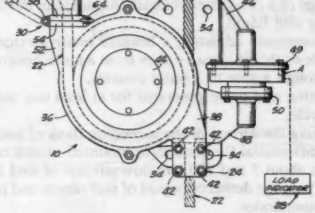
a testing device for checking that the loading state is operating correctly, said testing device comprising a member for introducing into the calculation chain a perfectly calibrated voltage of a load raised of greater value than any value inserted into said memory from the previously prepared diagrams and being easily identifiable, whereby to enable the checking of the correct operation of the checking device before it is used.

4,228,682

VARIABLE CABLE HOISTING SYSTEM HAVING QUICK DISCONNECT DEADLINE LOAD INDICATING APPARATUS

Elmer L. Decker, Long Beach; James Moon, Santa Ana, and Paul R. Maxwell, Bakersfield, all of Calif., assignors to Decker Engineering Corporation, Long Beach, Calif.

Filed Dec. 4, 1978, Ser. No. 966,381
Int. Cl.³ G01L 5/04
U.S. Cl. 73—143 **11 Claims**



1. In a hoisting cable system in which a single fastline connected at one end with a main hoist drum is trained over sheaves of a crown block and travelling block and has a deadline portion connected with a cable anchor and weight indicating apparatus, the improvement in which said apparatus is arranged to enable conversion to a double fastline cable system by disconnecting the deadline from said apparatus and its reconnection to the main hoist drum, said apparatus comprising:

an anchoring means fixed on the end of said deadline portion;

a base structure;

a snubbing drum rotatably supported on said base structure and adapted to receive a plurality of loops of the deadline thereon;

said base and snubbing drum respectively having adjacently spaced arm extensions relatively movable in response to tension forces on said deadline;

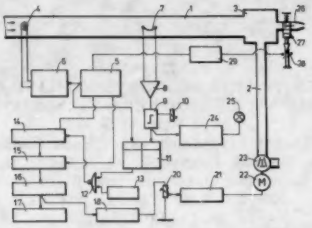
force sensing and indicating means interconnecting said arm extensions; and

means on said snubbing drum for releasably engaging and securing the said anchoring means on the end of said deadline to said snubbing drum and in its released position enabling detachment of the end of the deadline from the snubbing drum and its reattachment to the main hoist drum to effect the double fastline system.

4,228,683
METHOD OF DETERMINING LIQUID FLOW IN A CONDUIT

Richard Juffa, Cologne; Georg Wawra, Leverkusen, and Walter Uerdingen, Schildgen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 813,604, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 696,153, Jun. 14, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 896,825
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527378; May 26, 1977, 2723809
Int. Cl.³ G01F *1/68, 1/70*
U.S. Cl. 73—204 **5 Claims**



1. A method for measuring the velocity of a liquid flowing continuously or discontinuously in a conduit at rates between about 20 and 1000 cm^3/minute comprising:

(A) injecting a thermopulse of between about 5 and 100 ms in duration into the liquid by means of a wire having a weight of less than about 15 mg and being heated by the discharge of a condenser centrally mounted in the conduit carrying said liquid,

(B) simultaneously adjusting a bistable multivibrator to its set mode so that it allows pulses from a pulse generator to pass through a gate to a pulse counter,

(C) activating said pulse generator for at least one measurement cycle,

(D) detecting the arrival of the ascending flank of said pulse with a differential thermocouple mounted in said conduit between about 5 and 500 mm downstream of said heater,

(E) amplifying the detection signal of said sensor and passing it to a comparator,

(F) using said amplified signal to activate said comparator and using the output of said comparator to activate the reset mode of said bistable multivibrator thereby closing said gate to further pulses of said pulse generator,

(G) reducing the value accumulated in said pulse counter by the heat up time of said wire,

(H) converting the value accumulated in said pulse counter during the set/reset cycle of the multivibrator to a value equivalent to the velocity of said liquid by means of a permanently programmed ROM-code converter, and

(I) storing the value accumulated in said impulse counter until the next set/reset cycle of the multivibrator is completed.

4,228,684
REMOTE TEMPERATURE MEASURING SYSTEM WITH SEMICONDUCTOR JUNCTION SENSOR

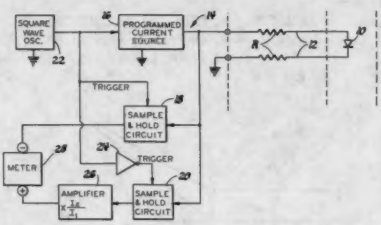
Jackson R. Templin, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 4, 1979, Ser. No. 45,269
Int. Cl.³ G01K *7/10*
U.S. Cl. 73—362 SC **2 Claims**

1. A temperature measuring circuit for measuring the effect of temperature on the voltage drop across a semiconductor junction sensor located remotely from the measuring circuit wherein the measuring circuit is connected to the sensor by a pair of conductors having lead resistance, comprising;

a current source connected to the conductors for providing to the sensor first and second currents alternately having a fixed ratio thereby producing first and second voltages respectively across the conductors wherein said voltages each include a lead component arising from the lead resistance and the respective current,

means for detecting the first and second voltages,



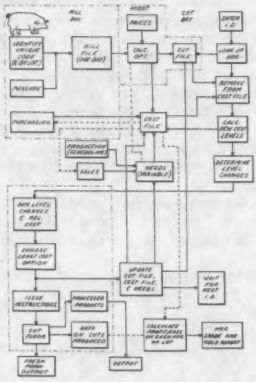
means for multiplying the first voltage by the said fixed ratio to derive a third voltage having a lead component equal to that of the second voltage, and

means for measuring the difference between the second and third voltages to obtain an output which is free of any lead component and which varies substantially linearly with the temperature of the sensor.

4,228,685
METHODS FOR COMPUTER ASSISTED OPTIMIZATION OF MEAT CUTS FROM CARCASSES

Charles H. Wallace, Carrollton, and Richard W. Moncure, Hayes, both of Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 857,324, Dec. 5, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 51,311
Int. Cl.³ G01D *21/02;* **G01F** *15/46*
U.S. Cl. 73—432 R **19 Claims**



1. A method for optimizing the value of finished cuts obtained from each individual carcass in a series of carcasses to be processed in a given period of time into said finished cuts, where said series of carcasses progress through a killing department, a chilling department and a cutting department in that order, said method comprising the step of:

identifying each of said carcasses with at least one different alphanumeric type indicia promptly after the kill in said killing department;

measuring selected predetermined physical variables of each of said carcasses in said killing department;

coupling said indicia and said measurements of each of said carcasses to a computer for storage therein;

determining current market indicators and production information when said carcasses are in said chilling department;

coupling said market indicators and production information to said computer for storage therein;

employing said computer to determine from said measurements and the results of said determining step optimum carcass cutting instructions for each of said carcasses; and

utilizing said indicia of each of said carcasses in said cutting department to retrieve said cutting instructions from said computer for each of said carcasses to effect optimization of said value of said finished cuts produced from each of said carcasses and thereby optimize said value of said finished cuts produced from said series of carcasses.

4,228,686

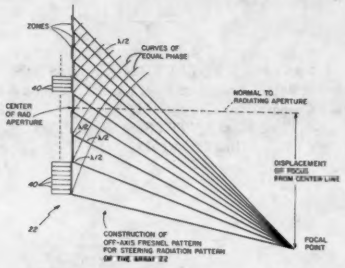
FRESNEL FOCUSSED IMAGING SYSTEM

Roger H. Tancrell, Cambridge, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 866,325, Jan. 3, 1978, Pat. No. 4,145,931. This application Nov. 20, 1978, Ser. No. 962,571

Int. Cl.[3] G01N *29/00*

U.S. Cl. 73—626 **7 Claims**



1. An imaging system comprising:

an array of radiating elements oriented toward a subject for communicating radiant energy between said array and a site within said subject;

first means for generating a first group of signals modulated in the format of a cosinusoidal Fresnel pattern having an off-axis format;

second means for generating a second group of signals modulated in the format of a sinusoidal Fresnel pattern having an off-axis format;

corresponding signals of each of said groups being coupled to respective ones of said radiating elements; and

means for combining said corresponding signals to form a Fresnel signal pattern for said array to provide a focal point for said radiant energy adjacent said array.

4,228,687

ULTRASONIC TRANSDUCERS

Brian W. Fraser, Livingston, Scotland, assignor to EMI Limited, Hayes, England

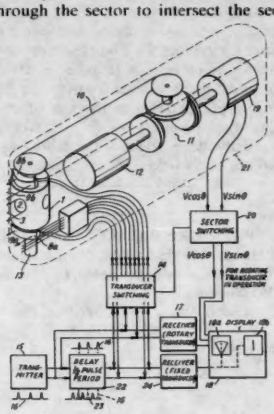
Filed Mar. 23, 1979, Ser. No. 23,344

Claims priority, application United Kingdom, Mar. 31, 1978, 12810/78

Int. Cl.[1] G01N *29/04;* **A61B** *10/00*

U.S. Cl. 73—626 **16 Claims**

1. An ultrasonic examination apparatus including first ultrasonic transducer means arranged to scan at least one beam of ultrasonic energy through a sector of a circle centred on the transducer means and to receive ultrasonic energy reflected from reflecting objects disposed within the sector and second ultrasonic transducer means comprising at least two transducers symmetrically disposed about the first transducer means and arranged to co-operate to direct in effect a beam of ultrasonic energy through the sector to intersect the sector at a



region in a substantially constant position relative thereto and to receive ultrasonic energy reflected from reflecting objects disposed in said region.

4,228,688

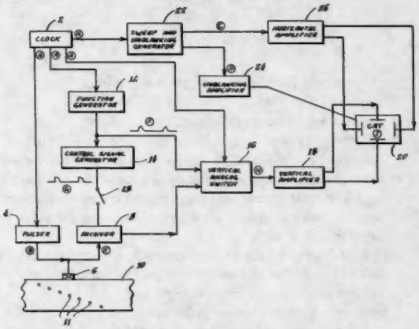
ACCURATE DISTANCE AMPLITUDE COMPENSATION

Donald E. Sharpe, Woodbury, Conn., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Feb. 26, 1979, Ser. No. 15,112

Int. Cl.[3] G01N *29/04*

U.S. Cl. 73—631 **31 Claims**



9. In a system for ultrasonic pulse echo testing having means for applying ultrasonic pulses to a workpiece, transducer means for converting ultrasonic pulse echoes reflected from said workpiece into reflected electrical pulses, a receiver for receiving said reflected electrical pulses, and means for displaying electrical signals, the improvement comprising:

means for generating a voltage function having a characteristic curve which is adjusted to conform to the amplitudes of electrical pulses corresponding to ultrasonic pulse echoes reflected from equal sized discontinuities at varying depths within a testpiece;

control signal generator means for receiving and modifying said voltage function, in accordance with a predetermined relationship, into a control signal having a value which, when applied to said receiver, will vary the gain of said receiver to attenuate and substantially equalize reflected

electrical pulses representative of pulse echoes returned from equal sized discontinuities in said testpiece; and

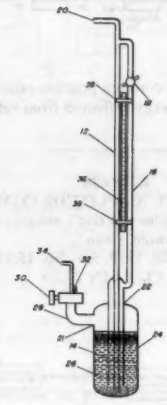
means for selectively applying said control signal to said receiver for varying the gain of said receiver, whereby the attenuated amplitudes of reflected electrical pulses representative of pulse echoes from workpiece subsequently tested are proportional to the size of corresponding reflecting discontinuities within said workpieces, and are substantially independent of the depth of said discontinuities within said workpieces.

4,228,689

PRESSURE RELIEF MANOMETER

Tetsuyuki Hirata, Morris County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 2, 1979, Ser. No. 26,371
Int. Cl.³ G01L *7/18*
U.S. Cl. 73—747 **4 Claims**



1. A pressure relief manometer comprising:

a container for liquid;

a liquid mass in said container;

first generally upright tube means for containing a first column of said liquid responsive to barometric pressure;

second generally upright tube means substantially parallel to said first tube means, said second tube means containing a second column of said liquid responsive to pressure variations in a test area;

said first upright tube means extending into said container below the surface of said liquid and terminating at a terminal opening of said first tube means;

a portion of said second tube means extending into said container concentrically within said first tube means to a location below said liquid,

said second tube means terminating at a terminal opening below said terminal opening of said first tube means, and

selectively openable and closeable vent means communicating with the interior of said container for venting gas pressure within said container.

4,228,690

DRIVE AND CLUTCH FOR A TIMING MECHANISM

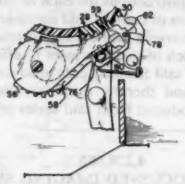
Thomas F. Ring, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Aug. 6, 1979, Ser. No. 64,029
Int. Cl.³ F16H *27/04*
U.S. Cl. 74—122 **8 Claims**

1. In a timing mechanism wherein a cam means is rotatably driven by power drive means through an intermittent drive means, an improvement characterized by said intermittent drive means comprising:

(a) first and second ratchet means coupled to said cam means,

(b) first and second drive pawls coupled to said power drive means engaging said first and second ratchet means respectively,



(c) a no-back clutch operably associated with said cam means preventing reversal thereof during its advancement, and

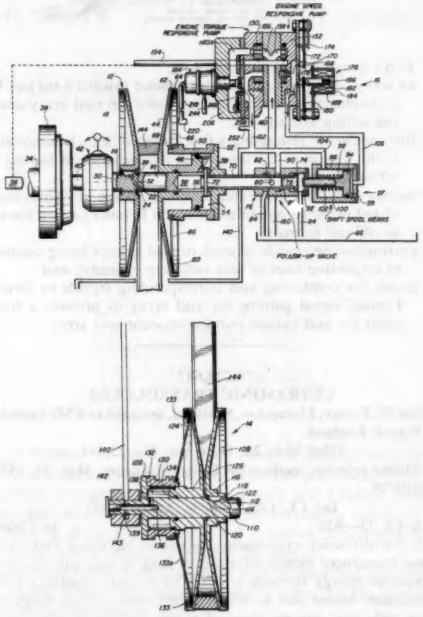
(d) disengaging means to disengage one of said drive pawls from said cam means and to hold said one drive pawl in disengagement for at least a portion of a program of said timing mechanism.

4,228,691

VARIABLE PULLEY TRANSMISSION

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 1, 1977, Ser. No. 773,358
Int. Cl.³ F16H *55/52*
U.S. Cl. 474—12 **11 Claims**



1. A variable pulley transmission for a vehicle comprising:

a driver shaft;

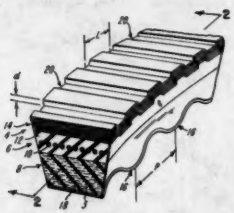
a driven shaft;
a rotatable driver pulley connected to said driver shaft;
driving means for rotating said driver shaft;
said driver and driven pulleys each comprising an axially fixed flange and an axially movable flange;
belt means drivingly connecting said pulleys;
spring means operatively associated with said driver and driven axially movable flanges normally urging said movable flanges axially toward said driver and driven fixed flanges;
hydraulic control means operatively associated with said pulleys to provide an additional load to the load of said spring means to thereby change the relative positions of the flanges of said pulleys and thus change the speed ratio therebetween;
said hydraulic control means comprising:
a pair of fixed displacement pumps, one of which provides pressure responsive to the speed of said driving means and the other of which provides pressure responsive to the torque of said driving means;
a hydraulic cylinder and a piston in said cylinder;
said driver pulley movable flange being connected to said piston;
said cylinder being connected to said pump providing torque responsive pressure; and
a speed and torque responsive valve in the connection between said pump providing said torque responsive pressure in said cylinder.

4,228,692

ENDLESS POWER TRANSMISSION BELT AND METHOD OF MANUFACTURE

Richard J. Jacob, Dayton, and Dale L. Waugh, Springfield, both of Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Aug. 15, 1977, Ser. No. 824,579
Int. Cl.[3] F16G *1/00*
U.S. Cl. 474—251 **20 Claims**



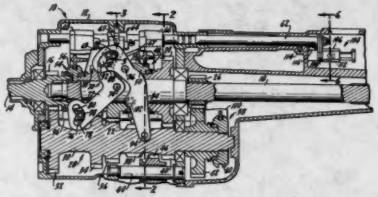
1. A method for manufacturing an endless V-type transmission belt having an inner compression section, an outer tension section and a load-carrying section positioned between said compression section and said tension section which comprises the steps of; placing a layer of uncured rubber around a first forming member to form a compression section, applying a load-carrying section around said uncured rubber layer, applying a plurality of layers of fabric around said load-carrying member to form a tension section, placing a second forming member around said fabric layers, said second forming member having corrugations in its inner surface and forming corresponding corrugations in at least two of said layers of said fabric in said tension section at approximately right angles to said load-carrying member, vulcanizing the resulting assembly to complete the corrugations, and cutting the vulcanized assembly into a plurality of finished belts.

4,228,693

TRANSMISSION SHIFT CONTROL APPARATUS

Donald W. Kelbel, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 11, 1978, Ser. No. 968,058
Int. Cl.[2] F16H *3/38*; G05G *5/10, 9/12*
U.S. Cl. 74—339 **14 Claims**



1. In a multiple speed ratio power transmission having gear ratios selectively engageable for defining torque delivery paths between an input member and an output member, and shift control means for selectively engaging gear ratios; the improvement wherein said shift control means comprises first engaging means slidable in one direction for engaging one gear ratio, second engaging means slidable in said one direction for engaging another gear ratio, and linkage means, said linkage means including a first lever pivotal about a first fulcrum between an intermediate position and first and second extreme positions, a second lever pivotal about a second fulcrum between third and fourth extreme positions, said levers being constructed and arranged such that said second lever is in said third extreme position when said first lever is in said intermediate and first extreme positions, said first lever and said first engaging means defining first camming means for sliding said first engaging means in said one direction in response to pivoting of said first lever from said intermediate position to said first extreme position, and said first and second levers defining second camming means for sliding said second engaging means in said one direction in response to pivoting of said first lever from said intermediate position to said second extreme position.

4,228,694

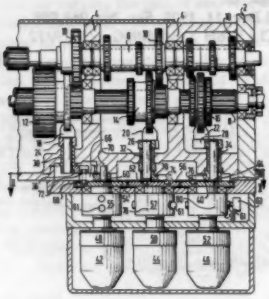
SHIFT MEANS FOR A MULTI-SHAFT SLIDING GEAR

Hans H. Adam, Vaterstetten, Fed. Rep. of Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,516
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806904
Int. Cl.[3] F16H *3/22*
U.S. Cl. 74—342 **13 Claims**

1. In a shift means for a multi-shaft sliding gear having a plurality of sliding gear blocks displaceable in the axial direction, each one of which is connected, by way of a mechanical transmission means, to a separate electric servo-drive, the improvement comprising wherein each servo-drive comprises an electric servo-motor equipped with a gear reduction unit,

and a planar cam drive which is arranged between said servomotor and the transmission means and has a swinging output



lever, the two end positions of the output lever corresponding to the end positions of the sliding gear block.

4,228,695

COLLAPSIBLE-STEERING UNIT FOR MOTOR VEHICLES

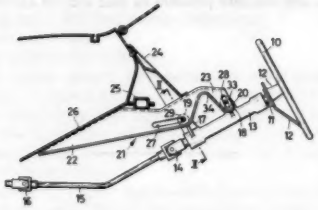
Renato Trevisson, Arese, and Guido Pizzocri, Gerenzano, both of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Filed Jun. 2, 1978, Ser. No. 911,915

Claims priority, application Italy, Jun. 2, 1977, 24319 A/77

Int. Cl.[2] B62D *1/18*

U.S. Cl. 74—492 **4 Claims**



1. A collapsible-steering unit for a motor vehicle comprising a steering column having a deformable section, a steering wheel connected to said column, column support means for rotatably supporting said column, anchoring means for attaching said column support means to a vehicle body said anchoring means including a first relatively rigid part and a second part yieldingly connected to said relatively rigid part for movement in a preselected direction upon driver impact with the steering wheel, first connection means between said column support means and said first part of said anchoring means, said first connection means being independent of said second part of said anchoring means and permitting movement of said column supporting means relative to said first part of said anchoring means in said preselected direction upon driver impact with the steering wheel, friction means between said first connection means and said first part of said anchoring means and second connection means between said column support means and said second part of said anchoring means.

4,228,696

STEERING GEAR FOR MOTOR VEHICLES

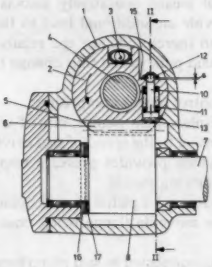
Erich Jablonsky, Boebingen, Rems, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, A.G., Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,639

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1977, 2635958

Int. Cl.[2] B62D *3/06*; F16H *25/22, 55/28*

U.S. Cl. 74—499 **9 Claims**



1. The combination in a steering mechanism of a worm gear steering nut member having a gear rack, and a gear section member engaged therewith including a steering shaft carrying said steering nut member and on which the said steering nut member has relative rotation;

resilient bias means carried intermediate said steering nut member and said gear sector member to adjust for backlash disposed to exert a torque force on said steering nut member effecting said relative rotation whereby the teeth of said steering nut rack and said gear sector member are maintained in flank engagement.

4,228,697

VEHICLE TRANSMISSIONS

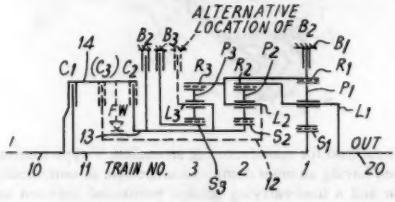
Albert A. Miller, Galashiels, Scotland, assignor to AB Volvo, Gothenburg, Sweden

Filed Nov. 4, 1977, Ser. No. 848,688

Claims priority, application United Kingdom, Nov. 5, 1976, 46221/76

Int. Cl.[2] F16H *57/10*

U.S. Cl. 74—758 **6 Claims**



1. In an epicyclic change-speed gearing comprising at least three epicyclic gear sets drivingly connectable between an input and an output, each gear set comprising a sun gear, a planet carrier, an internally toothed ring gear and at least one planet pinion which meshes with both the sun gear and the ring gear of its respective gear set and is itself mounted for rotation about its axis in said planet carrier which is mounted for rotation about the common axis of the sun gear and ring gear of its respective gear set, in which the planet carrier of the first gear set is rotationally secured to the ring gear of the second gear set, the input is connected to the sun gear of the first gear set, the output being taken from the planet carrier of the first gear

set, and means are provided for holding at least one of the ring gear of the first gear set and the sun gear of the second gear set against driving reactions, the improvements in which the ring gear of the third gear set is rotationally secured to the planet carrier of the second gear set, the planet carrier of the third gear set is rotationally secured to the sun gear of the second gear set, and further holding means are provided for holding the sun gear of the third gear set.

4,228,698

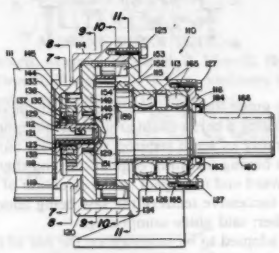
SPEED REDUCER

Michael E. Winiasz, 4009 Washington Ave., Lorain, Ohio 44052

Filed May 8, 1978, Ser. No. 903,856

Int. Cl.³ F16H *1/28*

U.S. Cl. 74—805 **1 Claim**



1. A speed reducer which comprises:

a housing including a back portion having a first pair of projecting separator pins each of which is generally square in cross section and including a front portion having a second pair of projecting separator pins each of which is generally square in cross section;

a rotatable input shaft extending through the back portion of the housing;

a first eccentric bushing fixedly mounted on the input shaft to rotate therewith;

a driving spur gear mounted on the first bushing and having a third pair of separator pins each of which is generally square in cross section projecting therefrom toward the back portion of the housing;

a first eccentric separator plate located between the back housing portion and the driving spur gear, the first separator plate having two opposed pairs of slots, one of the pairs of slots adapted to receive the first pair of separator pins from the back housing portion and the other pair of slots adapted to receive the third pair of separator pins from the driving spur gear, both pairs of pins being movable within the slots to maintain the driving spur gear nonrotating with respect to the housing;

a driven internal gear which engages the nonrotating driving spur gear and which is rotated thereby;

a second eccentric bushing fixedly mounted on the driven internal gear to rotate therewith;

a driving internal gear mounted on the second bushing and having a fourth pair of separator pins each of which is generally square in cross section projecting therefrom toward the front portion of the housing;

a second eccentric separator plate located between the front portion of the housing and the driving internal gear, the second separator plate having two opposed pairs of slots, one of the pairs of slots adapted to receive the second pair of separator pins from the front housing portion and the other pair of slots adapted to receive the fourth pair of separator pins from the driving internal gear, both pairs of pins being movable within the slots to maintain the driving internal gear nonrotating with respect to the housing;

a driven spur gear which engages the orbiting nonrotating driving internal gear and is rotated thereby; and

a rotatable output shaft extending from the front portion of the housing and coaxial with the input shaft, the driven spur gear being fixedly mounted on the output shaft to rotate the output shaft therewith.

4,228,699

GEAR ASSEMBLIES AND TRANSMISSION

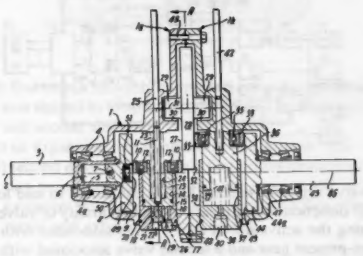
Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hertfordshire, England

Filed Mar. 21, 1979, Ser. No. 22,635

Claims priority, application United Kingdom, Mar. 22, 1978, 11384/78

Int. Cl.³ B60K *41/04*

U.S. Cl. 74—853 **34 Claims**



1. A variable ratio gear assembly comprising:

a first member having a first axis about which the first member is intended to be rotatably driven, said member having a drive face which extends laterally relative to said first axis;

a second member having a second axis which extends laterally relative to the first axis and about which second axis the second member is intended to be rotatably driven, said second member engaging or being capable of engaging said drive face so that, when one of said members is rotatably driven about its axis, rotation is imparted to the other member by oil film or traction drive; and

control means for displacing one of the members relative to the other and substantially in the direction of the second axis while the second member is maintained in engagement with the drive face to vary the ratio of drive which is transmitted between the members.

4,228,700

AUTOMATIC TRANSMISSION WITH ELECTRONICALLY CONTROLLED TORQUE TRANSMISSION DURING GEAR SHIFT

Helmut Espenschied; Uwe Kiencke, both of Ludwigsburg, and Alfred Schulz, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,324

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742031

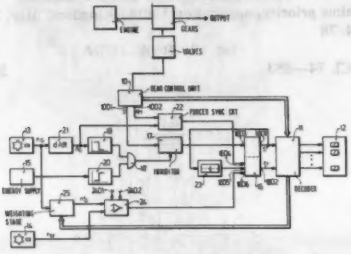
Int. Cl.³ B60K *41/06*

U.S. Cl. 74—866 **23 Claims**

1. In a system having a transmission for transmitting torque from an engine to an output, said transmission having a plurality of gears, a plurality of valves one associated with each of said gears, gear control means (10) for furnishing a shift signal indicative of initiation of a gear shift from a then-present gear to a selected gear and a direction signal (RH) indicative of the direction of said shift, engine speed sensor means (14) coupled to said engine for furnishing an engine speed signal indicative of the speed thereof, transmission output speed sensor means (13) coupled to said transmission for furnishing a transmission speed signal indicative of the output speed of said transmission,

and means (15) for furnishing a load signal indicative of the then-present load on said engine,

the improvement comprising load/shift direction sensor means (31) having a first input connected to said gear control means to receive said direction signal and a second input connected to said means for furnishing a load signal for furnishing a selector signal indicative of a predetermined combination of engine load and shift direction;



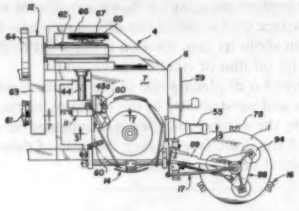
and valve activator means (33, 11) connected to said load/-shift direction sensor means and said plurality of valves for timing the activation of a first valve associated with said then-present gear and a second valve associated with said selected gear at least in part under control of said selector signal.

4,228,701

SAW TOOTH CUTTING APPARATUS

Ivey Herpin, Rte. 5, Ennis, Tex. 75119

Filed Jan. 2, 1979, Ser. No. 547
Int. Cl.[2] B23D *65/02*
U.S. Cl. 76—29 **14 Claims**



1. Apparatus for forming teeth on a circular saw blade comprising

a frame;

a vertical drive spindle rotatably supported in said frame; a collet chuck mounted at the upper end of said spindle for supporting and clamping a saw blade in a generally horizontal plane;

a rotary cutter, having peripherally spaced radially projecting teeth, mounted for rotation about an axis disposed in the plane of a supported saw blade; said cutter coacting with dies disposed in the plane of the blade to cut the blade teeth;

said chuck being mounted for lateral feed, transversely of its axis of rotation, into and out of cutting relation with said rotary cutter;

a pneumatic actuator for actuating said chuck to clamp and release a blade; a pneumatic actuator for feeding said chuck;

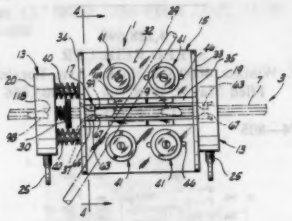
a plurality of cam operated pneumatic valves for controlling said pneumatic actuators; a plurality of cams nonrotatably mounted on a cam shaft for controlling said pneumatic valves; and drive means for driving said spindle, said rotary cutter, and said cam shaft at selected speeds relative to each other.

4,228,702

FILE GUIDE FOR USE IN SHARPENING A CHAIN SAW

Don S. D. Stewart, R.R. #3, Vandalia, Ill. 62471, and Jack L. Ricke, R.R. #2, Fillmore, Ill. 62032

Filed May 14, 1979, Ser. No. 38,482
Int. Cl.[3] B23D *63/10, 63/16*
U.S. Cl. 76—36 **16 Claims**



1. A file guide for use in sharpening a chain saw, said chain saw comprising a bar, a chain around the periphery of the bar, and a plurality of teeth secured at intervals along the chain, each tooth having a cutting edge at one end thereof constituting its forward end in respect to the direction of movement of the chain, successive teeth of the saw being allochiral relative to each other; said guide comprising:

a frame adapted to be mounted on the bar of the chain saw having means for releasably securing it to the bar;

a carriage slidably mounted on the frame for forward and rearward movement relative to the tooth to be sharpened and having means for guiding a file for reciprocation at a predetermined angle relative to said tooth through a cutting stroke of the file for sharpening said tooth at said angle and a return stroke, said means for guiding the file comprising a pair of guide members one on one side of the tooth and the other on the other side of the tooth, said guide members being spaced longitudinally of the carriage; and

a stop carried by the frame for holding the tooth against rearward movement;

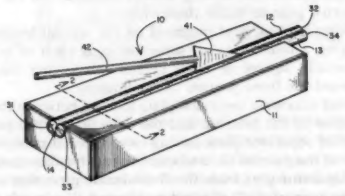
said carriage being movable rearward so as to position the file in engagement with the cutting edge of the tooth for the cutting stroke of the file and being movable forward so as to position the file out of engagement with the cutting edge of the tooth for a return stroke of the file.

4,228,703

DEVICE FOR SHARPENING ARROWHEADS

Donald C. Moss, Box 55, Bonds Flat Rd., La Grange, Calif. 95329

Filed Mar. 2, 1979, Ser. No. 16,939
Int. Cl.[3] B21K *17/00*
U.S. Cl. 76—86 **1 Claim**



1. A device for sharpening broadhead arrows having a shaft terminating in individual blades having straight beveled edges converging forwardly to a point comprising: a first cylindrical file having a uniform circular cross section along its length, a central longitudinal axis, cutting ridges on the outside surface thereof, and a first end and a second end; a second cylindrical

file having a uniform circular cross section along its length, a central longitudinal axis, cutting ridges on the outside surface thereof, and a first end and second end wherein the first cylindrical file has a primary cutting ridge diagonal to the axis of the file and defining a clockwise path proceeding from the first end of the file to to the second end, the second cylindrical file has a primary cutting ridge diagonal to the axis of the file and defining a counterclockwise path proceeding from the first end of the file to the second end; and means for holding said first file and second file in tangential, adjacent contact along a line on their respective outside surfaces with their longitudinal axes parallel thereby forming a longitudinal recess between said file, said means for holding said files being dimensioned so as to allow the files to be rotated about their respective axes so as to bring different portions of their outer surfaces into contact.

4,228,704

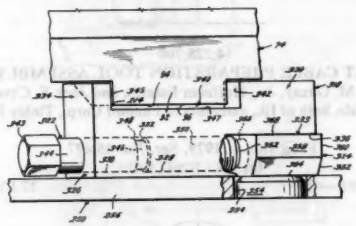
MARINE RISER TOOL

Robert D. Barnett, Magnolia; Charles D. Morrill, Bellaire, and Andre H. Drouin, Houston, all of Tex., assignors to McEvoy Oilfield Equipment Company, Houston, Tex.

Continuation of Ser. No. 694,187, Jun. 9, 1976, abandoned. This application May 24, 1978, Ser. No. 909,091

Int. Cl.³ B25B *13/46*

U.S. Cl. 81—57.39 **1 Claim**



1. A tool for rotating a nut having a lug, the nut being rotatably mounted with respect to a reference member, the reference member having a hole therethrough, comprising:

a first member including

engagement means for engaging the lug,

a base,

a threaded bore longitudinally located below said engagement means,

a cutout located at one end of said threaded bore forming an upper surface substantially parallel to said base;

a second member including

a peg having a diameter less than the diameter of such reference member hole,

a platform attached to said peg, said platform having a width greater than the diameter of such reference member hole, the height of said platform being substantially equal to the height of said cutout, said upper surface being positioned to be supported on the surface of said platform; and

a screw jack telescopically received in said threaded bore and engaging the side of said platform.

4,228,705

TOOL HOLDING DEVICE

Marvin M. Heisner, Howell, Mich., assignor to Fansteel Inc., North Chicago, Ill.

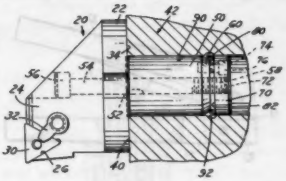
Filed Apr. 30, 1979, Ser. No. 34,445

Int. Cl.³ B23B *29/20*

U.S. Cl. 82—36 R **12 Claims**

1. In a tool holder and support combination wherein the support has a cylindrical recess opening to a first support surface, the recess having means forming a first shoulder facing away from said surface, and said tool holder has a cylindrical extension on an axis extending from a second support surface to lie in face-to-face contact with said first surface, that improvement which comprises a tool holder having:

(a) an annular second shoulder formed on said extension to serve as a camming surface and spaced from said second surface to lie in proximity to said first shoulder,



(b) first means movably supported on said cylindrical extension shaped to form an annular groove in conjunction with said second shoulder,

(c) an expansive ring confined in said groove, and

(d) second means to move said first means toward said extension to expand said ring radially beyond the cylindrical extension into annular contact with said first shoulder to retain said extension in said recess.

4,228,706

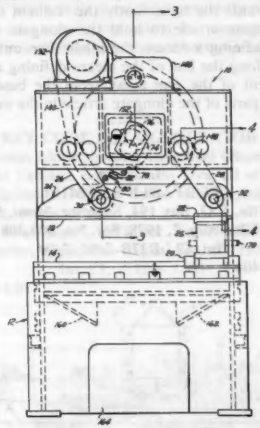
SWINGING RAM CUT-OFF MACHINE

John J. Borzym, Birmingham, Mich., assignor to Alpha Industries, Inc., Novi, Mich.

Filed Aug. 18, 1976, Ser. No. 715,559

Int. Cl.³ B26D *7/26;* **B23D** *25/06*

U.S. Cl. 83—320 **24 Claims**



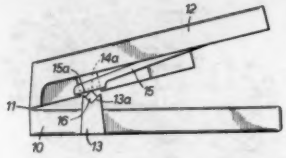
1. In a cut-off machine for severing lengths from an elongated workpiece while said workpiece is in motion, said cut-off machine being of the type adapted to operate a cut-off die set and support said cut-off die set for sliding movement while engaged with said workpiece, said machine including a die set operating ram, means supporting said ram for arcuate swinging movement in a plane parallel to said line of movement of said workpiece and die set, said machine also including a ram actuating mechanism for swinging said ram on said means supporting said ram for swinging movement, the improvement wherein said actuating mechanism includes adjustment means for selectively shifting the segment of said arcuate path through which said ram is caused to swing, whereby the vertical stroke and downmost position of said ram may thereby be adjusted.

4,228,707

CUTTER FOR CUTTING MATCH SPLINTS

John Arlett, Camberley, England, assignor to Bryant & May Limited, London, England

Filed Feb. 12, 1979, Ser. No. 11,545
Int. Cl.[3] B27L 9/00; B26D 5/10
U.S. Cl. 83—387 **3 Claims**



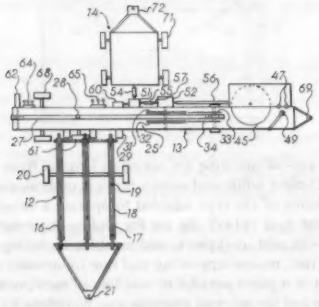
1. A cutter for cutting elongate articles and comprising:
a base,
means defining a shaped recess in the base for holding the elongate article against movement transverse to the length thereof,
means defining a slot in the base, said slot intersecting the means defining the shaped recess to divide said means defining a shaped recess into two parts,
an arm overlying the base,
a hinge connecting the arm to the base to allow pivotal movement of the arm towards or away from the base,
a blade held in the arm in register with the means defining the slot in the base,
and resilient means mounted on the arm on opposite sides of the blade for engaging the elongate article in the means defining the recess, whereby, on pivotal movement of the arm towards the base, firstly the resilient means engage the elongate article to hold the elongate article in the means defining a recess, the blade then cutting the held article along the line of the means defining a slot, pivotal movement of the arm away from the base leaving the severed parts of the elongate article in the means defining a recess.

4,228,708

PORTABLE SAWMILL

Peter B. Martin, P.O. Box 194, Superior, Mont. 59872

Filed Aug. 7, 1978, Ser. No. 931,308
Int. Cl.[2] B27B 7/02, 7/04
U.S. Cl. 83—404.1 **10 Claims**



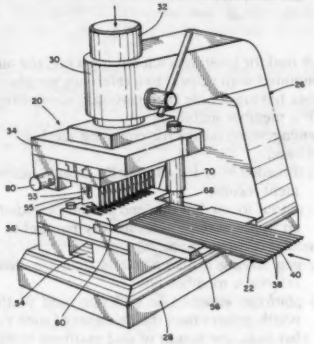
1. A portable sawmill including a log positioning section, a log sawing section and drive means for said log positioning section and said log sawing section; said log positioning section including a supporting frame with an inclined face and a conveyor means disposed along said inclined face of said supporting frame with means to engage and move logs transversely of their lengths up the inclined face, said log sawing section including an elongated substantially horizontal log bed adjacent the upper end of the inclined face of said supporting frame, first conveyor means for moving logs along said bed, a first saw assembly including at least two substantially vertical saw blades rotatably mounted on a common horizontal drive shaft disposed adjacent said log bed, means for adjusting the spacing between said substantially vertical saw blades, at least two vertically disposed guide means positioned adjacent the delivery area of said substantially vertical and aligned therewith saw blades, means for adjusting the spacing between said guide means, a second saw assembly including a plurality of substantially horizontal saw blades rotatably mounted on a common vertical drive shaft disposed adjacent to said log bed, second conveyor means for moving along said bed located adjacent the delivery area of said plurality of saw blades, and said drive means including controls for independently actuating said conveyor means of said log positioning section and said first and second conveyor means of said log sawing section; said means for adjusting the spacing between said substantially vertical saw blades including means for rotatably supporting one of said substantially vertical saw blades, said saw support means being associated with another of said substantially vertical saw blades and movable toward and away therefrom, and means for effecting movement of said saw support means.

4,228,709

FLAT CABLE PREPARATION TOOL ASSEMBLY

Casimer M. Guzay, Jr., Hoffman Estates, and Jack E. Caveney, Hinsdale, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Jun. 4, 1979, Ser. No. 45,497
Int. Cl.[3] B26D 9/00
U.S. Cl. 83—620 **17 Claims**



1. A tool assembly for use with a prime mover, such as a bench press, to prepare a flat cable for its termination in a mass termination connector, said assembly comprising:
upper and lower supports, at least one of which is adapted for attachment to said prime mover, for reciprocal movement relative to one another;
punch means carried by one of said supports for forming a series of windows in the flat cable insulation between adjacent conductors of the flat cable, said windows being aligned in a row extending transversely of the longitudinal direction of said cable;
cutter means carried by one of said supports for severing the conductors of said flat cable adjacent said windows, said punch means extending further toward the support which does not carry the punch means than the cutter means extends toward the support which does not carry the cutter means, said supports being movable relative to one another between an open position wherein a flat cable

disposed between said supports is not punched or cut and a closed position wherein said windows are punched and said conductors severed, through an intermediate position wherein said cable is punched but the conductors are not cut;

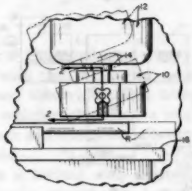
said assembly further comprising selectively operable stop means for limiting relative movement of said supports to said intermediate position whereby a single tool assembly selectively prepares flat cables for either daisy chain connection or dead end connection.

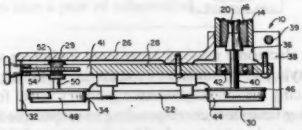
4,228,710

CUT-OFF SAW ATTACHMENT FOR MACHINE TOOL

Sylvester G. Karbowski, New Haven, Conn., assignor to Louis W. Palmieri and Marcia K. Palmieri, both of Hamden, Conn.

Filed May 23, 1979, Ser. No. 41,701
Int. Cl.³ B23D *53/10*; B27B *13/00*
U.S. Cl. 83—794 **12 Claims**





1. A cut-off saw attachment for a machine tool having means defining a work-support surface, a spindle support member movable generally toward and away from the work-support surface, a spindle journaled for rotation in said support member, and a coupling member carried by said spindle, said cut-off saw attachment comprising a frame, means for securing said frame in fixed position relative to said spindle support member for movement therewith, a drive wheel journaled for rotation relative to said frame, drive means connected to said drive wheel and coupled to said spindle by said coupling member for rotating said drive wheel in response to rotation of said spindle, and idler wheel supported for rotation on said frame in axially parallel relation to said drive wheel, said drive wheel and said idler wheel defining a throat region therebetween, and an endless band saw blade mounted on said drive wheel and said idler wheel in engagement with peripheral portions thereof and extending therebetween, said saw blade having a generally rectilinear portion extending through said throat region.

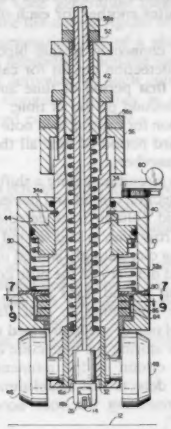
4,228,711

SELF-CASTERING GLASS CUTTER AND COMPENSATING BI-DIRECTIONAL HEAD

Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Filed May 17, 1979, Ser. No. 39,861
Int. Cl.³ B26D *3/08*; C03B *33/10*
U.S. Cl. 83—881 **6 Claims**

1. Apparatus for scoring sheet glass, comprising a support body adapted for relative movement in a plane generally parallel to the glass to be scored, piston means in said support body and adapted for limited reciprocating movement on a line oriented perpendicular to said plane, biasing means to urge the piston means toward the glass, and glass engaging rollers on said piston means, glass scoring wheel support means reciprocably mounted in said piston means for limited movement on the same line of action as that of said piston means, biasing means acting between said piston means and said wheel support means, said glass scoring wheel support means including a holder means rotatable on said line of action and defining a downwardly open slot with spaced inner stop surface segments, a pendulum member pivotally supported in said slot on an axis intersecting said line of action at right angles and



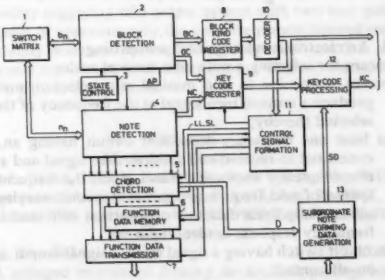
adapted for pendulous movement in said slot between limit positions determined by abutment with said stop surfaces, a glass scoring wheel provided in said pendulum member for rotation on an axis which is spaced rearwardly of said line of action to provide a castering action in one and an opposite direction, as a result of rolling contact between said wheel and the glass.

4,228,712

KEY CODE DATA GENERATOR

Yasuji Uchiyama; Akira Nakada; Takatoshi Okumura; Eiichiro Aoki; Eiichi Yamaga, and Akiyoshi Oya, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 7, 1978, Ser. No. 940,381
Claims priority, application Japan, Sep. 12, 1977, 52-109750
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **8 Claims**



1. A key code data generator comprising:

a switch matrix circuit including a plurality of key switches assigned to respective notes and connected between row lines and column lines, said row lines defining respective blocks of the key switches and said column lines defining respective notes of the key switches in each said block;

a block detection circuit connected to said switch matrix circuit for detecting all row lines to which key switches in operation are connected;

a note detection circuit connected to said switch matrix circuit for detecting all column lines connected with a single one of said detected row lines via the key switches in operation, and delivering note codes representing said detected row lines one after another in a time shared fashion, the column line detection being carried out for one row line after another for each of said row lines detected;

a control circuit connected to said block detection circuit and said note detection circuit for causing said row line detection in a first period of time and said column line detection in a second period of time;

a circuit connection for causing said note detection circuit to deliver in a third period of time all the note codes available one after another;

a chord detection circuit including a shift register connected to said note detection circuit and having stages for storing the state of said column lines detected with respect to predetermined row lines in said second period, contents of said stages being circulatingly shifted in synchronism with said time shared delivery of the note codes from said note detection circuit in said third period, and a chord type detecting logic connected to said stages for detecting establishment of one of predetermined types of chord; and

a code register for storing the note code delivered from said note detection circuit at the moment said chord type detecting logic detects said establishment, the registered note code representing the root note of the detected chord.

4,228,713

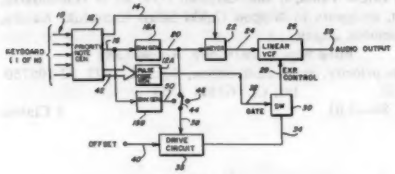
PROGRAMMABLE CURRENT SOURCE FOR FILTER OR OSCILLATOR

Glenn Gross, Chicago, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Continuation-in-part of Ser. No. 835,695, Sep. 22, 1977, Pat. No. 4,186,642. This application Jul. 3, 1978, Ser. No. 921,195

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 **23 Claims**



1. An electronic music circuit comprising:

means for selecting a note on a musical scale;

means responsive to said musical note selection means to produce a musical tone signal at the frequency of the note selected thereby;

at least one frequency-dependent circuit having an input connected to receive said musical tone signal and a separate frequency response control input, the frequency response of said frequency-dependent circuit varying as a substantially linear function of a current delivered to said frequency response control input;

an on-off switch having a signal input, a signal output, and an on-off control;

means for delivering to said signal input of said on-off switch an unchopped tuning signal which is separate from said musical tone signal;

a pulse source responsive to said musical note selection means to generate a series of control pulses having a duty cycle which is an exponential function of the musical scale position of said selected musical note, and connected to apply said control pulses to said on-off switch control so as to turn said switch on during each control pulse and off between control pulses for chopping said tuning signal at an exponential rate; and

means responsive to said signal output of said on-off switch to deliver to said frequency response control input a current proportional to the duty cycle of said chopped tuning signal, whereby the frequency response of said frequency-dependent circuit varies as an exponential function of the unchopped tuning signal.

4,228,714

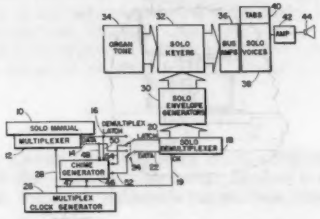
MULTIPLEX CHIME GENERATOR

Stephen L. Howell, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jan. 2, 1979, Ser. No. 158

Int. Cl.³ G10H *1/26, 5/10*

U.S. Cl. 84—1.01 **13 Claims**



1. In an electronic musical instrument including a keyboard having playing keys, multiplex means for scanning said keys and producing a cyclically recurring binary serial format data word having time slots corresponding to respective keys of the keyboard and a keydown pulse in a time slot corresponding to an actuated key of the keyboard, demultiplex means synchronized with said multiplex means and connected to receive said serial format word for converting said serial format word to a parallel format signal, and tone generating and keying means controlled by said demultiplex means for producing tones associated with the keys corresponding to time slots in said serial format data word in which keydown signals appear, the improvement being a pitch generator comprising means connected between said multiplex and demultiplex means for inserting in said serial format word a keydown pulse in an advance time slot located ahead of said time slot corresponding to said actuated key whereby tones associated with said actuated key and the key corresponding to said advance time slot will be produced, the keydown pulse in said advance time slot being a predetermined number of time slots ahead of said time slot corresponding to said actuated key and being independent of the actuation of any other key of the keyboard.

4,228,715

STRAIN-GAUGE SOUND PICKUP FOR STRING INSTRUMENT

Carl-Ernst Nourney, Am Wagenrast 6, D-4000 Düsseldorf 12, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 935,916

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738256

Int. Cl.³ G10H *3/18*

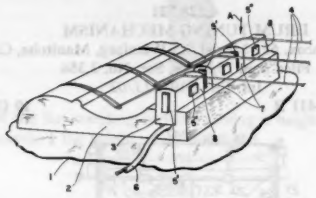
U.S. Cl. 84—1.16 **8 Claims**

1. In a musical instrument having a bridge, a plurality of electrical tone pickups, a sounding element, and a plurality of elongated strings maintained under longitudinal tension and bearing through said bridge on said sounding element, the improvement wherein:

said electrical tone pickups are strain gauges fixed to said bridge,

said strings are arranged in groups each having at least one string and at least one such strain gauge is secured to said bridge between each group and said sounding element,

said strain gauges each have a predetermined respective direction of maximum sensitivity arranged substantially perpendicular to the respective group of strings, each strain gauge extending between the respective group and said sounding element,



said bridge is elongated transversely of said strings and is formed with slots extending generally parallel to said strings and subdividing said bridge into a plurality of sections which each engage a single respective group of said strings and which each have at least one such strain gauge, and

said bridge is formed with a groove extending generally perpendicular to said slots and subdividing each of said sections into a pair of subsections.

4,228,716

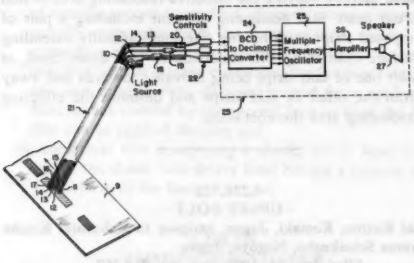
DEVICE AND METHOD FOR OPTICAL TONE GENERATION

James Linford, Livingston Manor, N.Y., assignor to I-Production Establishment, Vaduz, Liechtenstein

Continuation of Ser. No. 820,348, Jul. 29, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,267

Int. Cl.[3] G10H *3/06*

U.S. Cl. 84—1.18 **10 Claims**



1. An optical generating device for use as a teaching or musical aid for generating a tone coded in pitch to the color of a colored control surface, comprising:

a generally elongated member configured to be hand-held at least at a first end portion as a baton or wand;

a light source attached to said generally elongated member and adapted to direct light onto such colored control surface when said generally elongated member is guided thereover;

a plurality of color-selective light pick-up and transmitting means attached to said generally elongated member, said light pick-up and transmitting means being responsive to light of different respective colors reflected from such colored control surface and adapted to direct said light onto a respective plurality of photosensors when said generally elongated member is guided thereover and light is directed thereon from said light source;

a plurality of light responsive photosensors positioned and adapted to receive light from said respective color-selective light pick-up and transmitting means and capable of producing respective electrical output signals indicative of the presence or absence of light of said respective colors;

multiple-frequency tone generation means positioned and adapted to receive the output signals of said photosensors for selectively generating one of a plurality of different frequency tones dependent upon the specific combination of photosensors activated by such control surface when said generally elongated member is manually directed over such colored control surface.

4,228,717

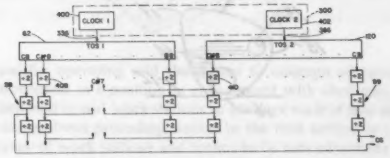
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING A CHORUS SOUND

David A. Luce, Clarence Center, N.Y., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Continuation-in-part of Ser. No. 696,195, Jun. 15, 1976, Pat. No. 4,145,943, and a continuation-in-part of Ser. No. 588,508, Jun. 19, 1975, Pat. No. 4,099,439. This application Jun. 2, 1978, Ser. No. 911,716

Int. Cl.[3] G10H *1/02, 5/06*

U.S. Cl. 84—1.24 **4 Claims**



1. For use in an electronic musical instrument having a keyboard with a plurality of keys and an output system adapted to receive tone signals and convert them into sound waves, a tone signal generator for generating a plurality of tone signals comprising:

first and second sources of clock pulses differing in frequency by an integral number of semitones;

first and second top octave synthesizer means connected respectively to said first and second clock pulse sources for producing, respectively, first and second series of tone pulse signals, each of said series corresponding to a different tempered scale; and

means responsive to the operation of said keys for simultaneously supplying said output system with two tone pulse signals of approximately the same frequency derived individually from non-corresponding outputs of said first and second top octave synthesizer means, whereby the sound of a chorus is simulated.

4,228,718

MAGIC CHORDER

Robert L. Smith, 1037 E. Beddell St., Fort Worth, Tex. 76115

Continuation-in-part of Ser. No. 828,415, Aug. 29, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 943,197

Int. Cl.[3] G10D *3/00*

U.S. Cl. 84—317 **6 Claims**

1. A stringed instrument fretting device, comprising: body means adapted to be secured to the neck of said instrument;

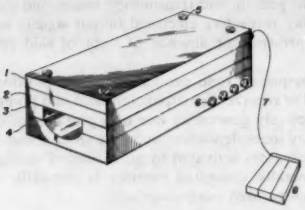
a plurlaity of fretting rods located within said body means in string fretting locations;

electromanetic means for actuating said rods;

circuit means for selectively activating said electromagnetic means;

finger-operated switches mounted on said body means and

electrically connected with said circuit means for actuating a single rod to fret a single selected note; and



foot-operated switches spaced from said body means but electrically connected with said circuit means for actuating a plurality of said rods to fret selected chords.

4,228,719

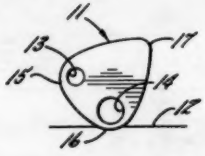
PLECTRUM FOR STRINGED MUSICAL INSTRUMENTS

George W. Keene, P.O. Box 333, Rochelle, Ill.

Filed Jul. 25, 1979, Ser. No. 60,399

Int. Cl.³ G10D *3/16*

U.S. Cl. 84—322 **4 Claims**



1. A plectrum for a stringed musical instrument comprising a single piece of resilient molded plastic material, said piece including at least two rounded corners each adapted to be used selectively for engaging the strings of the instrument while a portion of the piece other than the corner being used is held by hand, and a plurality of holes formed in said piece, one adjacent each of said corners, said holes being of different sizes whereby the flexibility of the portions of the piece adjacent each of said corners is individually different.

4,228,720

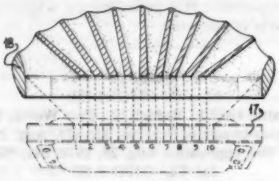
HARMONICA PLAYING MEANS

James W. Vidler, 38 High St., Waratah, N.S.W., 2298, Australia

Filed Apr. 24, 1979, Ser. No. 32,959

Int. Cl.³ G10D *7/12*

U.S. Cl. 84—377 **4 Claims**



1. In a mouth-blown harmonica, the improvement wherein the wind-entrance apertures thereof are in communication with a trumpet, said trumpet having therein a plurality of discrete flaired channels, each wider at the respective inlet end thereof than at the respective outlet end thereof, each outlet end of said plurality of channels terminating in registration with a single wind-entrance aperture of said harmonica, and each respective inlet end of said channels terminating in an embouchure aperture of mouth-conforming size, all said embouchure apertures lying in longitudinal juxtaposition along the outer periphery of said trumpet, allowing each separate note of said harmonica to be sounded by the entire mouth of a player applied selectively to an appropriate one of said embouchure apertures which is in communication, via its associates channel, with the wind-entrance aperture corresponding to said note.

4,228,721

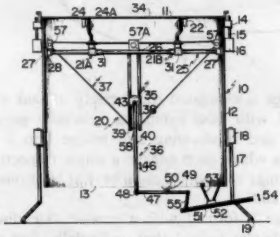
DRUM TUNING MECHANISM

Elwyn J. Hancox, 651 Muriel St., Winnipeg, Manitoba, Canada

Filed Jan. 15, 1979, Ser. No. 3,354

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—411 R **19 Claims**



1. A tuning mechanism for musical drums which include a substantially cylindrical body and a skin stretched over one end of the body and constituting a drum head; said tuning mechanism comprising in combination:

(a) at least one deadening element in contact with the underside of the drum head,

(b) means mounting said deadening element within said body,

(c) and means within said body operatively connected to said deadening element to move same across said drum head thereby varying the effective resonating area of said drum head, said deadening element including a pair of opposed strips each having one longitudinally extending surface contacting the underside of said drum head, at least one of said strips being movable towards and away from the other of said strips and defining the effective resonating area therebetween.

4,228,722

UPSET BOLT

Hiroshi Kazino, Komaki, Japan, assignor to Kabushiki Kaisha Aoyama Seisakusho, Nagoya, Japan

Filed Jun. 16, 1978, Ser. No. 916,257

Claims priority, application Japan, Apr. 4, 1978, 53-44076[U]

Int. Cl.² F16B *23/00*

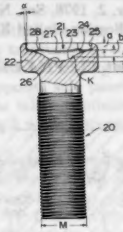
U.S. Cl. 85—9 R **1 Claim**

1. A hexagonal bolt having a threaded body and a bolt head provided with a pressure formed recess, the recess being formed by a combined surface comprising:

a lower concave surface, the radius of curvature of the concave surface being about ½ the nominal diameter M of the threaded body of the bolt,

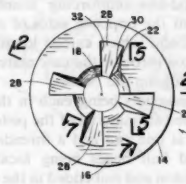
a middle convex surface oppositely curved to said concave surface, a lower end of the convex surface being smoothly conjugated with a top end of said concave surface and the radius of curvature of the convex surface being about 1.7 to 2 times the nominal diameter M of the threaded body of the bolt, and

a plurality of upper flat standing hexagonal surfaces spaced from the outer periphery of the hexagonal bolt head, each



of the flat standing surfaces having a height of approximately ¼ the height of the bolt head.

4,228,723
FASTENER RECESS
Hilary H. Cunningham, 9132 E. 37th Ct., Tulsa, Okla. 74145
Filed Sep. 16, 1977, Ser. No. 833,732
Int. Cl.[2] F16B *23/00*
U.S. Cl. 81—460 **7 Claims**



1. A rotational fastener having a recess and associated driver tool comprising;

(a) centrally disposed frusto-conical recess carrier by the fastener surrounding the rotational axis thereof, a plurality of equally spaced wrenching element recesses extending radially outwardly from the frusto-conical recess, each wrenching element recess comprising a first force application face lying in a plane containing the fastener rotational axis and an oppositely disposed second force application face, means carried by the second face to limit the force that can be applied thereto; and

(b) the driver tool comprising a shank, driver head at one end of the shank, said driver head having a convex shape to conform to the fastener recess.

4,228,724
AMMUNITION LOADER
Robert A. Leich, 4208 Chimney Pointe Dr., Bloomfield Hills, Mich. 48013
Filed May 29, 1979, Ser. No. 42,758
Int. Cl.[3] F42B *33/02*
U.S. Cl. 86—26 **25 Claims**

1. A press type ammunition loader for performing successive loading steps on shell casings to produce loaded cartridges therefrom, said loader including:

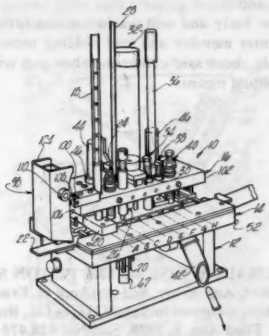
an upper platen assembly and a lower platen assembly and means mounting said upper platen assembly over said lower platen assembly for guided up and down movement with respect thereto;

drive means for causing cyclical movement of said upper platen assembly relative to said lower platen assembly to cause a movement of said upper platen assembly towards said lower platen assembly and back to an elevated position with respect thereto;

a linear array of work stations extending across said lower platen assembly;

a corresponding number of loading process components carried by said upper platen assembly at points thereof in vertical alignment with said work station locations on said lower platen assembly;

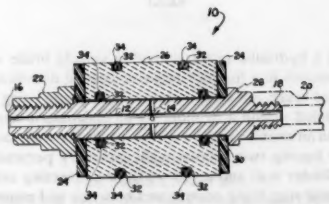
an elongated shuttle bar slidably mounted on said lower platen assembly for movement relative to said linear array of work stations, said shuttle bar having a series of casing engaging notches formed along one edge thereof adjacent said linear array of work stations;



means for operating said shuttle bar to undergo advancing movement in a position in engagement with shell casings disposed in said work stations to advance each of said shell casings from preceding station to the next station in said array of work stations and thence to be moved outwardly out of engagement with said shell casings and thence to a return position retracted one station a distance corresponding to the distance between stations and thence inwardly into engagement into said shell casings;

means being operated in response to said relative movement of said lower and upper platen assemblies to produce said movement of said shuttle bar with each cycle of descending and ascending movement of said upper platen assembly with said lower platen assembly.

4,228,725
ROTARY PISTON
Kenneth Jai, 3425 Durwood Dr., Beaumont, Tex. 77704
Filed Jun. 13, 1978, Ser. No. 915,159
Int. Cl.[3] F16J *1/02, 1/08*
U.S. Cl. 92—159 **1 Claim**



1. A rotary piston having an elongated, cylindrical, tubular center member, a piston body having a cylindrical interior fitting around the exterior of said center member between the ends of said center member, and holding means mounted on the ends of said center member for retaining said piston body

intermediate the ends of said center member against longitudinal movement, hole means leading from the interior of said center member to the interior of said piston in which the improvement comprises:

said piston body comprising a solid, cylindrical body of a material selected from the group consisting of structural carbon and graphite, said piston body including groove means for holding sealing rings located on its interior and on its exterior, and

an elastomeric, fluorocarbon sealing ring located within each of said groove means,

nylon washer means located at each of the ends of said piston body between said piston body and said holding means, and

said piston body and said washer means fitting relative to said center member and said holding means so as to be rotatable about said center member and with respect to said holding means.

4,228,726

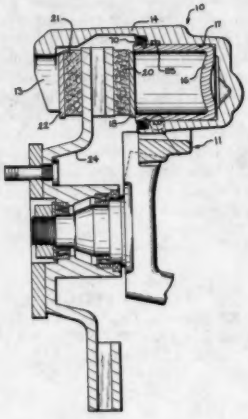
HYDRAULIC DISC BRAKE PISTON SEAL

Kurt H. Rinker, Ann Arbor, and Anthony C. Evans, Westland, both of Mich., assignors to Kelsey Hayes Co., Romulus, Mich.

Filed Aug. 1, 1978, Ser. No. 928,474

Int. Cl.³ F16J *15/18*

U.S. Cl. 92—168 **5 Claims**



1. In a hydraulic piston activated vehicle brake wherein a piston moves in a forward brake-activating direction and in a rearward brake-releasing direction, said piston being hydraulically sealed within a cylinder by an elastomeric annular ring seated in an annular groove within a cylinder wall, said annular groove having two groove walls generally perpendicular to said cylinder wall and a groove floor connecting said groove walls, said ring being compressed between said piston and the groove floor, thereby hydraulically sealing said piston in said cylinder, the improvement wherein said groove floor comprises a flat portion generally parallel to said cylinder wall and an inclined portion, said flat portion being located at the forward end of the groove floor and said inclined portion being located at the rearward end of the groove floor and being sloped toward said cylinder wall.

4,228,727

PISTONS

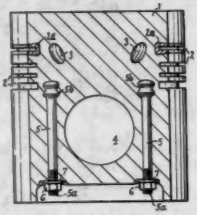
David C. Speaight, and Gerald Longfoot, Lymington, England, assignors to Wellworthy Limited, Lymington, England

Filed Mar. 2, 1978, Ser. No. 882,778

Claims priority, application United Kingdom, Mar. 21, 1977, 11873/77

Int. Cl.³ F16J *1/00*

U.S. Cl. 92—228 **1 Claim**



1. A cast light metal piston comprising:

a crown;

a skirt cast integral with and depending from said crown;

two gudgeon pin bosses integral with and provided in said skirt and defining respective gudgeon pin holes;

a plurality of rod-like reinforcing members respectively located adjacent the opposite sides of each of said gudgeon pin holes, and which extend longitudinally relative to the piston axis through the cast material of the piston forming said gudgeon pin bosses;

said reinforcing members being each in the form of a bolt embedded in the cast material of the piston and having an enlarged head at one end and a threaded portion at the other end, said bolt heads being located towards the crown of the piston and embedded in the cast material and said threaded end portions projecting from the cast material at the bottom of the piston, and having nuts fitted onto the said threaded end portions of the bolts, whereby tightening of the nuts imparts a compressive stress in the axial direction to the cast material of the piston on the opposite side regions of said gudgeon pin bosses.

4,228,728

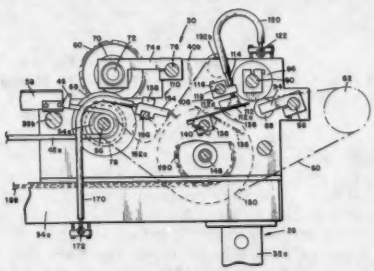
METHOD AND APPARATUS FOR REMOVING GUSSETS FROM FLAT TUBES

Alberta M. Hollis, Camden, Ark., assignor to International Paper Company, New York, N.Y.

Filed Mar. 8, 1979, Ser. No. 18,722

Int. Cl.³ B31B *1/26*

U.S. Cl. 93—84 TW **29 Claims**



24. A method for removing longitudinal gussets from a substantially flat tube of flexible material having opposite side panels and wherein each gusset includes a pair of gusset panels

connected to each other along a longitudinal fold line and connected to respective ones of the side panels along fold lines so that the gusset panels are foldable to lie in juxtaposed relation between said side panels, said method comprising the steps of:

(a) moving the substantially flat tube along a guide path in a direction generally transverse to the longitudinal axis of the tube so as to establish leading and trailing edges,

(b) separating the opposite side panels from each other at their leading edges while continuing to move the tube along said guide path while disposed generally transverse thereto, and

(c) simultaneously restricting forward movement of one of said side panels while continuing to advance the other of said side panels so as to cause said gusset panels to be withdrawn from their folded positions between said side panels and lie in substantially coplanar relation with said side panels.

4,228,729

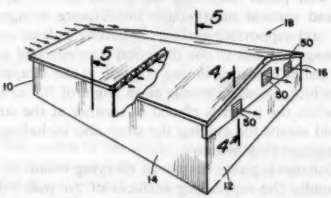
BUILDING ROOF STRUCTURE

Paul W. Messick, 1320 E. 58th St., Tulsa, Okla. 74105

Filed Jun. 19, 1978, Ser. No. 916,843

Int. Cl.[3] F24F *13/00*

U.S. Cl. 98—32 **4 Claims**



1. A roof structure for a building having first and second end walls and opposed side walls, the roof structure providing reduced ari conditioning load for the building, comprising;

spaced apart horizontal prulins supported at their ends by building exterior end walls, each purlin having a top edge and a bottom edge;

roof sheathing affixed to the top edges of said purlins;

ceiling sheathing affixed to the bottom edges of said purlins providing horizontal plenums between the roof and ceiling sheathing and between adjacent purlins, the horizontal plenums thereby extending the length and width of the building roof, the maximum height of the plenums being equal the height of the purlins;

means at the first end wall for providing ventilation into each of the plenums formed between said purlins;

a fan means includes;

a fan housing mounted on the second end wall having an intake communication with said plenums at the second end wall;

an exhaust opening in said fan housing; and

a fan supported in the fan housing which, when energized, withdraws air from the fan housing and thereby from the plenums and discharges air out said end wall exhaust opening.

4,228,730

AUTOMATIC FRENCH FRYER

James C. Schindler, Naperville, and Steve Kroll, Schaumburg, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Mar. 30, 1979, Ser. No. 25,379

Int. Cl.[3] A47J *37/12*

U.S. Cl. 99—329 R **34 Claims**

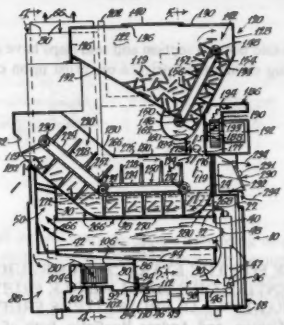
1. An apparatus for continuously feeding pieces of potato into hot cooking liquid at a predetermined rate, for frying pieces of potato in the liquid, and for discharging cooked pieces of potato from the liquid automatically, said apparatus comprising:

a frame;

a reservoir mounted on said frame for holding a predetermined amount of cooking liquid;

means for heating said cooking liquid in said reservoir;

hopper means mounted on said frame above said reservoir for holding a supply of said pieces of potato, said hopper means having at least one downwardly slanted bottom wall, said hopper means defining an inlet aperture through which said supply of potato pieces can be loaded into said hopper means and further defining a hopper discharge aperture spaced from said cooking liquid through which said potato pieces are passed;



an endless loop first conveyor means in said hopper means defining a conveying path at an angle relative to said one slanted bottom wall for removing said potato pieces from the bottom of said supply of said potato pieces in said hopper means and for delivering said potato pieces to said hopper discharge aperture for discharge of said pieces through the hopper discharge aperture into said cooking liquid; and

second conveyor means in said reservoir for transporting said potato pieces through said hot cooking liquid, said second conveyor means adapted for moving generally equal amounts of potato pieces per unit length of said conveyor means through said cooking liquid and for moving said potato pieces out of said cooking liquid after the pieces have been cooked.

4,228,731

PIE CRUST SHAPER

Irene Butler, 5652 Serene Dr., Huntington Beach, Calif. 92649

Filed Feb. 26, 1979, Ser. No. 15,189

Int. Cl.[2] A47J *37/00*

U.S. Cl. 99—433 **11 Claims**

1. A pie crust shaper for a bottom pie crust comprising:

a flat integrally formed open work bottom section having an outlying surrounding member conforming to the bottom of a pie pan;

a plurality of flaps movably fastened to said surrounding member; and,

wherein said bottom section and said flaps have a plurality of pricking elements to prick a pie crust upon contact.

4,228,732

DEVICE FOR THE EXTRACTION OF JUICES AND ESSENTIAL OILS FROM WHOLE FRUITS, IN PARTICULAR FROM CITRUS FRUITS

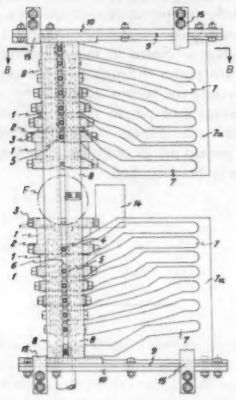
Mario D. Canton, and Andrea Bonfiglio, both of Tremestieri, Italy, assignors to W. Sanderson & Sons S.p.A., Valeria, Italy

Filed Oct. 12, 1978, Ser. No. 950,648

Claims priority, application Italy, Dec. 6, 1977, 52101 A/77; Jun. 1, 1978, 49659 A/78

Int. Cl.[2] **A23N** *1/00;* **B30B** *9/02*

U.S. Cl. 99—509 **13 Claims**



1. An apparatus for extracting juices and essential oils from whole fruits, comprising a first series of vertical cylinders having fruit-contacting edges, said cylinders being fitted with each other with slight radial clearances therebetween, a second series of cylinders axially aligned with the first series and spaced therefrom to allow for the insertion of a fruit between the first and second series of cylinders, and means for moving said cylinders in each series relative to each other to exert a progressive compressive action, substantially distributed all over the fruit surface.

4,228,733

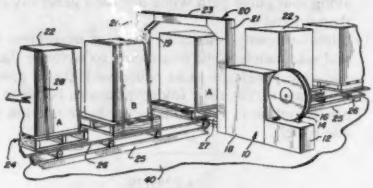
PACKAGE STRAPPING DEVICE WITH PALLET SENSING MEANS

James P. Davis, Crawfordsville, and Robert W. Smith, Darlington, both of Ind., assignors to Keystone Consolidated Industries, Inc., Crawfordsville, Ind.

Filed Apr. 30, 1979, Ser. No. 34,612

Int. Cl.[3] **B65B** *13/04*

U.S. Cl. 100—4 **14 Claims**



1. In a strapping machine for strapping an article to a pallet at a strapping station, said machine including means for guiding the strap around the article and the pallet at the strapping station, said means including an arch having substantially continuous top and downwardly extending connecting side portions, said pallet including horizontal article supporting surfaces and vertical substantially imperforate stringers connected to said supporting surfaces, whereby at least one open ended passage extends in one direction between said stringers when the pallet is placed in one position at the strapping station, but which passage extends at an angle of 90° to the first position when the pallet is placed in another at the strapping station; said means for guiding the strap also including,

first strap carrying means,

means for moving said first strap carrying means to a position under the supporting surfaces of the pallet through the passage in the pallet and between the stringers if the pallet is in said one position, to permit the article and the pallet to be tied together by said strap at said strapping station,

second strap carrying means, and

means for moving said second strap carrying means to a position under the stringers beneath said passage in said pallet if the stringers are in said other position to also permit the article and the pallet to be tied together by the strap at said strapping station,

means for detecting the position of the stringers of said pallet when it is positioned at said strapping station,

said means for moving the first strap carrying means to a position to carry the strap between said stringers of the pallet being actuated when said detecting means determines that it may do so,

said means for moving the second strap carrying means to a position to carry said strap beneath the stringers being actuated when said detecting means determines that the strap cannot be passed between the stringers of the pallet.

4,228,734

METAL CAN CRUSHER

Ernest H. Parrish, 313 Coral Hills, El Paso, Tex. 79912

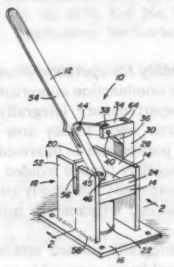
Filed Apr. 5, 1979, Ser. No. 27,902

Int. Cl.[3] **B30B** *9/32*

U.S. Cl. 100—245 **6 Claims**

1. A metal can crusher for deformably axially compressing a cylindrical metal can to a small fraction of its length comprising mounting means mounting the crusher and fixedly supporting an end of the cylindrical can and crushing means attached to the mounting means, said crushing means comprising a box assembly attached to the mounting means, a post assembly attached to the mounting means and box assembly, and movable handle means, the box assembly holding the metal can while the handle means exerts axial compressive force on the

end of the can opposite the end of the can supported by the mounting means, anvil means for delivering said axial compressive force to the can, said handle means having a post pivot at one end thereof for pivotal connection to said post assembly, said post pivot being disposed above said anvil means, said handle further having a center post medially disposed between the ends of said handle, linking means comprising a substantially linear toggle pivotally connected at its upper end to said center post and pivotally connected at its lower end to said anvil means at an anvil pivot for converting manual rotational movement of said handle means to linear compressive movement of said anvil means, said center post describing a segment of a circular arc during axial compression of the cylindrical metal can, the arc being centered on the post pivot, said post pivot, center post, and anvil pivot forming an angle in a substantially vertical plane which includes said handle and said toggle defining the sides of an angle with the center post con-



stituting the vertex of the angle, said angle increasing as said handle pivots downwardly about said post pivot and as said center post describes said arc during axial compression of the cylindrical metal can, said angle increasing to a straight angle upon maximum axial compression, whereby motion of the anvil means toward the mounting means axially compresses the can to said small fraction of its length and whereby maximum mechanical advantage is developable upon formation of said straight angle and whereby a snap is thence discernible in manual operation of the metal can crusher, said anvil means comprising a lug through which a pivot pin pivotally connects said lower end of said toggle to the anvil, said lug being removably attachable to said anvil and being characterised by a selectable distance from said anvil pivot to said anvil, whereby the position of the anvil when said straight angle is produced is selectable to permit control of said crushing fraction and to adapt the crusher to cans of a varying size.

4,228,735

OFFSET DUPLICATING MACHINE

Laurent Doucet, 4200 rue Majeau, Montreal Nord Quebec, Canada

Filed Jun. 19, 1978, Ser. No. 916,548
Claims priority, application Canada, Jan. 19, 1978, 295329
Int. Cl.³ B41F *13/54*
U.S. Cl. 101—227 **6 Claims**

1. An offset duplicating machine comprising, in combination:

a loading station for stacking sheets to be printed;

means for successively conveying separate sheets from said loading station;

a printing station for printing sheets conveyed from said loading station;

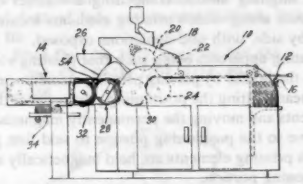
means for transferring printed sheets from said printing station;

an impression cylinder receiving said printed sheets from said transferring means and having a rotational axis perpendicular to the axis of travel of said printed axis;

first marking means on said impression cylinder and including a sheet marking edge extending lengthwise of said impression cylinder;

rotatable counter-roller mounted adjacent said impression cylinder and having a rotational axis of skew inclination relative to the rotational axis of said impression cylinder, said counter-roller having an outer surface of hyperboloidal shape lying adjacent to the outer surface of said impression cylinder and contacting said marking edge progressively along the length thereof as said sheets travel successively between said impression cylinder and said counter-roller whereby said sheets are marked transversely;

second marking means mounted on said impression cylinder in a plane coincident with the line of travel of said sheets; said second marking means defining a marking edge whereby said sheets may be marked lengthwise;



said first and second marking means consisting of elongated metallic strips having a base adhesively secured to the outer surface of said impression cylinder and teeth integral with said base, said teeth of said first-mentioned marking means being higher than that of said second marking means;

pressure roller having a rotational axis parallel to the rotational axis of said impression cylinder; said pressure roller being mounted circumferentially spaced from said counter-roller in the direction of the transferring means and extending over said second marking means whereby lengthwise perforation of said sheets is effected as said sheets pass between said pressure roller and said impression cylinder toward said first marking means, and

a delivery station for receiving said printed and marked sheets.

4,228,736

PRINTING APPARATUS

John B. Griffiths, 38, Charleville Rd., London, England (W14 9JH)

Filed Jul. 28, 1978, Ser. No. 929,016
Int. Cl.³ B41K *1/08*
U.S. Cl. 101—382 MV **3 Claims**

1. Printing apparatus comprising,

a set of printing elements, each printing element bearing a printing surface and containing magnetically soft material, each printing element of the said set having substantially the same height and thickness as each other, each printing element having on the surface opposite the printing surface a depiction of the design to be printed,

a holder including a permanently magnetised portion with

poles and a relatively moveable positioning portion, said positioning portion bearing an integral number of channels and covering at least one pole of the permanently magnetised portion, a said channel being shaped such that printing elements arranged side by side fit against the channel with their printing surfaces proud of positioning portion, the positioning portion being movable between two positions, a first printing element holding position in which said permanently magnetized portion is positioned adjacent said channels of said channels of said positioning portion to magnetically hold said printing elements, and a second printing element releasing position in which the permanently magnetized portion is moved a distance from the channel of said positioning portion sufficient to release the printing elements from the hold of the permanently magnetized portion,

and an aligning means, comprising a number of aligning channels along which printing elements locate slideably, side by side, with said depictions exposed,

the printing apparatus being such that printing elements are set in the holder by placing printing elements on the aligning means, fitting the positioning portion over the printing elements and moving the permanently magnetised portion relative to the positioning portion to said first position in which printing elements are held magnetically against the positioning portion,

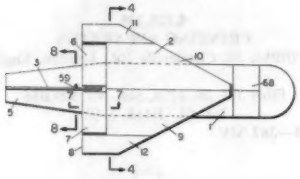
printing elements being released from the holder back to the aligning means by locating the holder with attached printing elements on the aligning means and moving the permanently magnetised portion relative to the positioning portion to a second position in which the printing elements are not held magnetically against the positioning portion.

4,228,737

GLIDE BOMB

Marvin J. Kahn; Robert J. Malchodi; Joseph P. Paine; Milton J. Rogers, all of Baltimore, and Robert L. Zouck, Pikesville, all of Md., assignors to AAI Corporation, Cockeysville, Md.

Filed Oct. 27, 1954, Ser. No. 465,015
Int. Cl.³ F42B *25/06*
U.S. Cl. 102—3 **7 Claims**



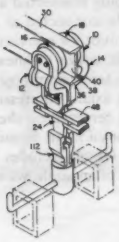
1. A glide bomb adapted to be carried in the bombay of an aircraft and released to glide along a predetermined path to a selected target for scattering units of destructive material over a relatively large area comprising, an elongated fuselage, a sustaining wing carried by said fuselage, said sustaining wing comprising a plurality of hinged panels foldable about said fuselage, means responsive to releasing said bomb for moving said panels into alignment for sustaining said bomb, control members carried by said wing, gyro controlled means carried by said bomb and connecting with said control members for actuating the latter whereby to cause said bomb to glide along said predetermined path, tail fins carried by said fuselage for stabilizing the bomb, means for releasing the sustaining wing at the end of the glide path, and means for canting said tail fins to cause said fuselage to spin about its longitudinal axis and impart a radial velocity to the units of destructive material when said fuselage is released from said wing.

4,228,738

CONVEYOR TROLLEY CONSTRUCTION

David J. Forshee, 350 Lakes Edge Dr., Oxford, Mich. 48051

Filed Sep. 22, 1978, Ser. No. 944,806
Int. Cl.³ B61B *3/00*
U.S. Cl. 104—95 **19 Claims**



1. In a trolley assembly for operation in an I-beam monorail conveyor system, the combination comprising

a pair of spaced apart unitary integrally formed molded plastic trolley arms, each trolley arm having an upper portion, a lower portion and an intermediate web portion,

a pair of unitary integrally formed molded plastic stub axles, each stub axle being easily removably attached to one said trolley arm, upon and adjacent the inward face of said upper portion,

a pair of unitary integrally formed molded plastic trolley wheels, each wheel being removably supported for rotation on and retained by said stub axle on the inward side of said trolley arm upper portion,

removable fastening means extending through said upper portion from its outer side and into said stub axle fixedly securing said stub axle against rotation to said upper portion inward face,

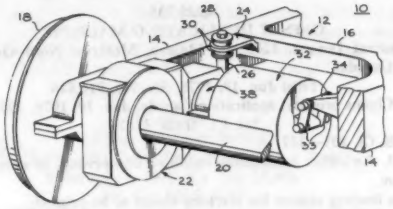
and a parts carrying pendant member removably secured to and between the lower portions of said trolley arms.

4,228,739

MOTORIZED RAILWAY TRUCK ARTICULATED SHAFT HOUSING

Thomas F. Fitzgibbon, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 1, 1977, Ser. No. 812,046
Int. Cl.³ B61C *3/00, 9/50;* F16C *1/06;* F16F *15/10*
U.S. Cl. 105—136 **23 Claims**



1. A railway motor mounting system comprising:

a truck frame supported on a wheel and axle set;

a gear box comprising a plurality of gears in a drive train coupled to directly drive the axle, said plurality including a pinion gear having an input shaft positioned adjacent one end of the gear box and connected to a drive gear attached to the axle;

means supporting said one end of the gear box from the

truck frame, the other end being supported on the axle by anti-friction bearings;

a traction motor having a housing and an output shaft parallel to the axle and flexibly coupled to drive the pinion gear shaft;

first motor support means mounting the rearward end of the motor housing remote from said output shaft to the truck frame; and

second motor support means mounting the forward end of the motor housing adjacent the output shaft to the gear box, said second support means comprising a flexible joint surrounding said shafts and extending between the gear box and the housing of the traction motor.

4,228,740

TRANSVERSELY INTERCONNECTED TRUCKS

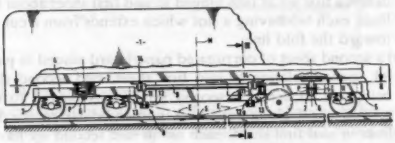
Hans H. Vogel, Tuttwil, Switzerland, assignor to Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland

Filed Jul. 10, 1978, Ser. No. 923,297

Claims priority, application Switzerland, May 12, 1978, 5179/78

Int. Cl.[2] B61F *3/08, 5/22, 5/44*

U.S. Cl. 105—168 **5 Claims**



1. In combination with a rail vehicle having at least two trucks each having at least two wheel set axles therein, a vehicle body and a pair of guide members, each said guide member connecting a respective one of said trucks to said vehicle body about a vertical axis for the transmission of lateral forces; a transverse coupling arrangement comprising

a shaft extending longitudinally of said vehicle body;

means supporting said shaft on said body; and

a linkage connecting said trucks to said shaft, said linkage including a pair of pivotal levers connected to said shaft in fixed relation and a pair of transverse steering rods, each said rod being linked to a respective lever and articulated to an end of a respective truck facing the other truck at a predetermined connection point, said connection point lying in an inclined plane passing through said vertical axis of said guide member connecting said respective truck to said body and through a transverse center plane of said body with said inclined planes intersecting at a point coincident with the plane of the upper surfaces of a pair of track rails.

4,228,741

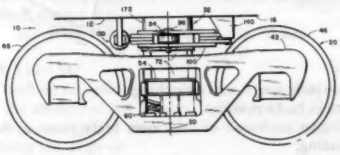
AUTOMATICALLY RELEASING STABILIZER

Frank D. Bruner, Omaha, Nebr., assignor to Paxton & Vierling Steel Co., Omaha, Nebr.

Filed Dec. 22, 1977, Ser. No. 863,395

Int. Cl.[2] B61F *3/08, 5/06, 5/14, 5/24*

U.S. Cl. 105—197 D **15 Claims**



1. An oscillation restraint device for a railway vehicle including a vehicle body and a wheel truck rotatable with the body, said device comprising:

means for automatically hydraulically locking the wheel truck so as to prevent substantially all oscillations of the wheel truck when the wheel truck is positioned in a first range of orientations;

means for automatically disengaging the locking means and thereby permitting wheeel truck rotation when the wheel truck is positioned in a second range of orientations, distinct from the first range of orientations; and

means for overriding the locking means and thereby permitting wheel truck rotation when forces tending to rotate the wheel truck exceed a predetermined value.

4,228,742

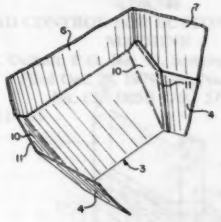
RAILWAY CAR INTEGRAL HOPPER STRUCTURE

Phillip G. Przybylinski, Schererville, and Terry B. Morgan, Hammond, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 29, 1977, Ser. No. 865,654

Int. Cl.[2] B61D *7/02, 7/14, 49/00*

U.S. Cl. 105—248 **5 Claims**



1. For a hopper vehicle having a generally vertically disposed hopper including a hopper chute, a hopper chute construction including

longitudinally spaced, downwardly and inwardly extending hopper chute slope sheets,

vertical partition sheets connected to said spaced hopper chute slope sheets,

transversely spaced, downwardly and inwardly extending hopper chute side sheets connected to said slope sheets, and

transversely spaced side walls connected to and extending upwardly from said side sheets and connected to opposite sides of said slope sheets and said partition sheets, the improvement comprising:

each of said slope sheets including transversely spaced corner plate portions and an intermediate portion connected with said corner plate portions,

said corner plate portions extending angularly upwardly and outwardly relative to said intermediate portion and being integrally formed therewith and thereby providing said slope sheets with a continuous channel surface, and

means connecting said corner plate portions to said side sheets, said corner plate portions forming generally planar surfaces extending between said intermediate portion and said side sheets to promote the flow of lading through the hopper chute.

4,228,743

BEHIND DOOR SHELF ASSEMBLY

Douglas H. Crook, 5849 32nd Ave. North, St. Petersburg, Fla. 33710

Filed Mar. 1, 1978, Ser. No. 882,380

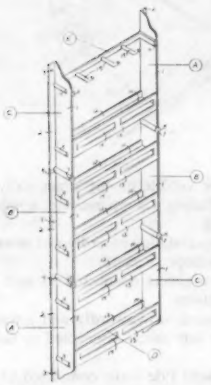
Int. Cl.[2] A47B *4/04*

U.S. Cl. 108—31 **7 Claims**

1. A shelving assembly comprising:

(a) a plurality of side panels of rectangular shape having

attached at their linear ends either element of a dowel-tube arrangement, the outer configuration of said dowel conforming in size and shape to fit closely inside the opening in said tube, said side panels comprising two sets of a top panel, a bottom panel and at least one intermediate panel, the top and bottom side panels of said assembly having only one of said elements and the intermediate said panels having two of said elements so arranged as to be fitted to and interlocked with its opposite element in the adjacent side panel, said side panel also having a slit running perpendicular to the length of said side panel and extending from the rear edge of said side panel to at least half but not more than 0.9 of the width of said panel, and each said side panel having a flange affixed to the back linear edge of said side panel and extending perpendicularly therefrom and adapted to be fastened to a vertical door or wall area, said flange having an opening positioned at and communicating with the said slot extending part way through the width of said side panel, said opening being enlarged with respect to the width of said slot



and adapted to receive a dowel element, and said flange being of appropriate length and positioned close to the adjacent end of any said doweled element attached to the corresponding side panel that it would extend over a portion of the tube element thereby preventing the dowel of the doweled element from sliding any further into the opening of said tube element and also thereby requiring the doweled member to be introduced from the opposite end into the opening of the tube member; and

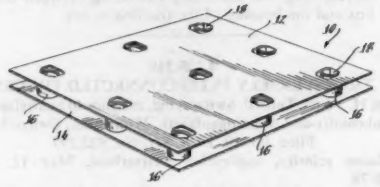
(b) a plurality of shelf elements comprising a rigid rectangular sheet or platform having a doweled element attached along the edge of each of the linear ends thereof, said doweled element being adapted to fit through the said opening in said flange and the end of said sheet to which said doweled element is attached being of an appropriate thickness to fit into one of said slots in said side panels, the width of the said rectangular sheet at the edge to which said doweled element is attached being only of appropriate dimension to extend the full length of the slot into which it is inserted.

4,228,744

PALLET FORMED FROM TWO SPACED, INTERLOCKING SHEETS OF CORRUGATED PAPERBOARD AND RIGID SLEEVES

Robert L. Moore, Nagog Woods, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed May 24, 1979, Ser. No. 42,138
Int. Cl.[2] **B65D** *19/34*
U.S. Cl. 108—51.3 **14 Claims**



1. A pallet comprising:

(a) a first sheet of corrugated paperboard which is cut to define a first set of tabs hinged to said first sheet about fold lines, each tab having a slot which extends from a cut end toward the fold line;

(b) a second sheet of corrugated paperboard placed in parallel, spaced relation to said first sheet, said second sheet being cut to define a second set of tabs hinged to said second sheet along fold lines perpendicular to the fold lines in said first sheet, each tab in said second set having a slot which extends from a cut end toward the fold line, wherein the slots in the tabs in said first set are aligned and engaged with the slots in opposed tabs in said second set; and

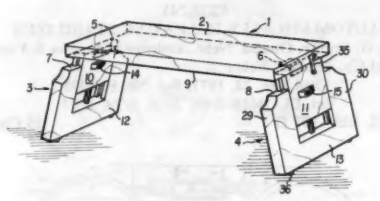
(c) a plurality of rigid sleeves, positioned between said first and second sheets and surrounding engaged pairs of opposed tabs, with the opposed ends of said sleeves functioning as load bearing surfaces, and wherein the width of each said first and second set of tabs adjacent its respective fold line is less than the width of the tab adjacent the cut ends thereof, such that more than one half of each said load bearing ends of said rigid sleeve is disposed contiguous with a sheet whereby the bearing capacity of said pallet is increased.

4,228,745

VARIABLY-ORIENTED FOOTSTOOL

Vernon M. Gale, 2021 N. Rockingham St., McLean, Va. 22101

Filed Aug. 23, 1978, Ser. No. 935,996
Int. Cl.[2] **A47B** *9/04, 3/08;* **A47C** *3/24*
U.S. Cl. 108—116 **10 Claims**



1. A variable footstool comprising:

(a) a main body position,

(b) a leg at each end of said main body portion, each leg including,

(c) a first leg portion secured to said main body portion and having a longitudinal bore therein and a slot therethrough, the slot being perpendicular to the bore; and

(d) a second leg portion longitudinally movably mounted with respect to said first leg portion, with

(e) adjusting means for infinite variation of the relative positions of said first and second leg portions, and

(f) at least one longitudinal guide means on said first and second leg portions parallel to the longitudinal bore,

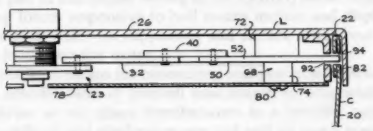
(g) said adjusting means comprising a member slidably located within the bore and having one end secured to said second portion, and a means for engaging the member located within the slot and engaging the member.

4,228,746

CONVENIENCE LOCKBOX

Myron A. Caton, Mission Hills, Calif., assignor to Coxwells, Incorporated, Los Angeles, Calif.

Filed Aug. 23, 1978, Ser. No. 936,313
Int. Cl.³ E05G *1/04*
U.S. Cl. 109—59 T **1 Claim**



1. A lock box comprising:

a container of four walls defining pairs of opposed horizontal edges in a rectangular configuration, said walls further defining horizontal slots at central locations contiguous the horizontal edges of said walls;

a cover defining an external ridge and further including lengths of angle stock to define an internal ridge aligned with said external ridge whereby said ridges mutually define a rectangular channel for receiving said container edges at the interior of said cover whereby said ridges cover said horizontal slots on either side of said walls;

a lock movement, centrally affixed in said cover to accommodate a rotary motion pattern;

pairs of cam members each including a stub shaft welded to said cover and a cam rotatively supported on said stub shaft and pivotally mounted contiguous to said internal ridge of said cover and unexposed at the exterior of said cover, for engaging said edges of said container by mating in said slots;

a linkage mechanism connecting said cam members to said lock movement for rotating said cam members to engage and disengage said container and including a first pair of arms each interconnecting one pair of said cam members and a second pair of arms interconnecting said lock movement to said first pair of arms whereby rotation of said lock movement rotates said cam members; and

a shield extending parallel to said cover whereby said linkage mechanism is sandwiched therebetween.

4,228,747

HIGH ENERGY ARC IGNITION OF PULVERIZED COAL

Martin E. Smirlock, Brimfield, Mass., and Donald A. Smith, Haddam, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

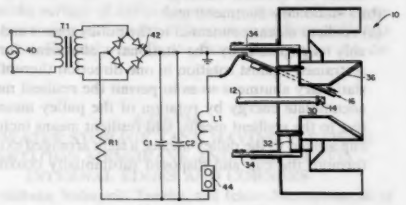
Filed Feb. 22, 1979, Ser. No. 13,836
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **10 Claims**

1. A method for igniting a fuel stream comprising pulverized coal in the absence of any sources of ignition energy other than an electric arc ignitor disposed in the stream, said method comprising the steps of:

establishing a fuel stream having a transport air-to-coal weight ratio of less than unity and having a velocity not exceeding 150 feet per second;

directing the fuel stream to an ignition zone, an electric arc ignitor projecting into the ignition zone; and

creating an intermittent electric arc in the fuel stream at the ignitor tip, said arc being established at a frequency in the



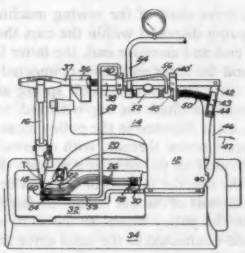
range of 8 to 12 times per second, each arc lasting for between 100 and 200 microseconds and resulting in the dissipation of between 6 and 12 Joules of energy at the ignitor tip.

4,228,748

THREAD CONTROL FOR BUTTONHOLE SEWING MACHINE

Armand A. Dufault, P.O. Box 92, Somerset, Mass. 02726

Filed Oct. 29, 1979, Ser. No. 89,566
Int. Cl.³ D05B *3/00, 53/00*
U.S. Cl. 112—65 **6 Claims**



1. In combination with a sewing machine having an elongated frame with a bed plate mounted on a support table so that the elongated frame faces the operator, a reciprocable needle having an eye and a presser foot, a source of thread and means guiding the thread to and through said eye of the needle, means holding the thread out of the path of the presser foot comprising a source of air located adjacent the needle above the bed plate to direct the air away from the operator and toward the thread to cause the thread to project above the presser foot when the foot is above the bed plate and means to control the air supply only when the presser foot is above the bed plate.

4,228,749

NEEDLE POSITIONING ATTACHMENT FOR SEWING MACHINE

Antonio Pugliese, Miami, Fla., assignor to Industrial Pugliese, Inc., Miami, Fla.

Filed Apr. 24, 1978, Ser. No. 898,899
Int. Cl.³ B65M *63/00*; D05B *69/36*
U.S. Cl. 112—274 **7 Claims**

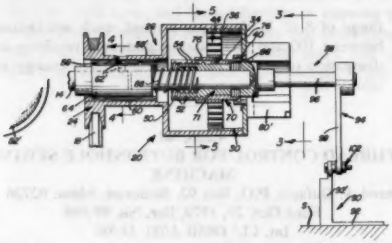
1. In a sewing machine comprising a head, a main drive shaft extending through the head and rotatably journaled thereon, a motor connected to the shaft for rotating same, and a needle positioning attachment, the improvement wherein the needle positioning attachment is connected to the shaft and arranged

for accumulating energy from the rotation of the shaft for actuation when the shaft ceases rotation in order to turn the shaft a predetermined amount, said needle positioning attachment comprising, in combination:

(a) pulley means affixed to the shaft and connected to the motor for rotation thereby;

(b) a stationary abutment; and

(c) resilient means connected to the pulley means and releasably engageable by the stationary abutment for being restrained against rotation in one direction thereof by the stationary abutment so as to permit the resilient means to accumulate energy by rotation of the pulley means relative to the resilient means, said resilient means including a cup affixed to the pulley means, a stem arranged extending through the cup and disposed substantially coaxial with



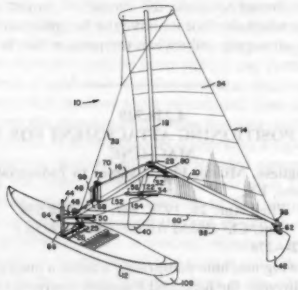
the main drive shaft of the sewing machine, and a spiral torsion spring disposed within the cup, the spring having an inner end and an outer end, the latter being affixed to the cup and the inner end being connected to the stem for winding tight the spiral torsion spring as the cup, and pulley means to which the cup is affixed, rotate relative to the stem, a nut disposed in the pulley means and provided with internal screw threads, with external screw threads being provided on the stem at a portion thereof disposed adjacent the nut, the threads of the stem being engageable with the threads of the nut for advancing the stem axially relative to the pulley means as the stem is threaded into the nut and connected to the main drive shaft of the sewing machine by means of the pulley means for coupling the stem to the drive shaft.

4,228,750

HYDROFOIL SAILBOAT WITH CONTROL TILLER

Bernard Smith, Rte. 1, Box 228A, King George, Va. 22485, and Frank P. Delano, P.O. Box 17, Oldhams, Va. 22529

Filed Jan. 12, 1978, Ser. No. 868,920
Int. Cl.[2] B63H *9/04*
U.S. Cl. 114—39 **14 Claims**



1. A hydrofoil sailboat comprising:

(a) a hull,

(b) a sailing frame including a sail, a plurality of interconnected spars, a pair of hydrofoils, one hydrofoil supporting each lower corner of the sail,

(c) means for securing one of said spars to said hull so that said sailing frame can pivot relative thereto,

(d) spreader mechanisms extending between said hull and said pair of hydrofoils for adjusting and maintaining said hydrofoils in a cooperative relation,

(e) each spreader mechanism including a separate control spreader situated at the hull and a hydrofoil spreader situated proximate to the hydrofoil, and control means extending between the control spreader and the hydrofoil spreader so that the movement of the control spreader controls the movement of the hydrofoil spreader, and

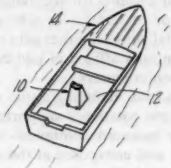
(f) manually operable means situated at the hull for simultaneously moving said spreader mechanisms to alter the position of both of said hydrofoils for steering said sail frame so that said sail frame tows said hull therebehind.

4,228,751

UNDERWATER VIEWING APPARATUS

Larry M. Robertson, and Calvin A. Robertson, both of 2860 Lenox, Troy, Mich. 48098

Filed Aug. 21, 1978, Ser. No. 935,658
Int. Cl.[3] A63C *5/00*
U.S. Cl. 114—66 **4 Claims**



1. An underwater viewing apparatus for use with a boat having a hull and an opening formed through the hull, said viewing apparatus comprising:

a transparent plate disposed above said opening;

a flat gasket disposed between said plate and the boat hull around said opening, said gasket having a portion which extends outwardly from said opening and along said hull;

means for fastening said plate to said hull around said opening so that said gasket is sandwiched between said plate and said hull thereby fluidly sealing said plate to said hull,

a housing having an open top, an open bottom and closed side walls, said bottom of the housing being positioned on said outwardly extending portion of said gasket, said housing being vertically dimensioned so that the top of the housing extends above the normal water line of said boat; and

means for detachably securing said housing to said boat hull, said securing means further comprising means for variably compressibly clamping the open bottom of the housing to the hull so that the outwardly extending portion of the gasket is sandwiched between the housing and the hull to thereby form a fluid seal between said housing and said hull such that water will rise only within the interior of said housing in the event said plate ruptures.

4,228,752

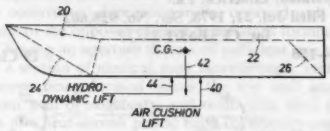
SURFACE EFFECT BOAT

Theodore E. Sladek, and Donald E. Maynard, both of P.O. Box 204, New Iberia, La. 70560

Continuation-in-part of Ser. No. 531,904, Dec. 12, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,142

Int. Cl.[3] B63B *1/38*

U.S. Cl. 114—67 A 1 Claim



1. A surface effect boat of the captured air bubble type for transporting loads over water and comprising:

(a) a pair of hull means having in use hydrodynamic supporting forces responsive to hull means motion and displacement in water for supporting said surface effect boat and a load upon the water;

(b) platform means for connecting said pair of hull means in a specific ratio of over-all boat length to boat width to define an air space therebetween in a specific ratio of widths of said platform means and said air space bounded by said platform means and depending hull means at the top and sides respectively;

(c) flexible curtain means fixed to and depending from said platform means and adapted for closing the ends of said air space; and

(d) air pressure means mounted on said surface effect boat and adapted to pressurize said air space for jointly supporting said boat and load in combination with said hull hydrodynamic supporting forces in a dual air-water spring mass system having respective spring rates with complementary dampening characteristics for stabilizing progress of said surface effect boat through water, and wherein said hull means has a center of gravity centered aft of said hydrodynamic supporting forces and forward of a center of said pressurized air space supporting force, whereby said surface effect boat is displaced in trim upwardly forward when said air space is depressurized.

4,228,753

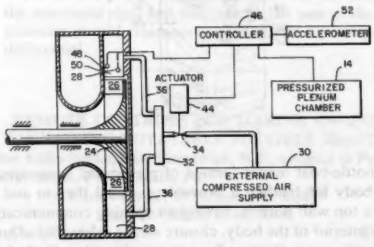
FLUIDIC CONTROLLED DIFFUSERS FOR TURBOPUMPS

Sydney Davis, Silver Spring, Md., and John M. Durkin, Vienna, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1979, Ser. No. 15,675

Int. Cl.[3] B63B *1/38;* F03B *3/18;* F04D *29/68*

U.S. Cl. 114—67 A 4 Claims



4. The method of improving efficiency of a centrifugal fan having a rotor which discharges air through a cascade of fixed curved diffuser vanes for converting velocity head to static pressure in air supplied downstream over a wide range of varying rates to meet flow demands comprising the steps of:

sensing pressure variations on opposite sides of the diffuser vanes; and

responding to the sensed pressure by selectively permitting the ejection of pressurized fluid of an independent source from the surface of diffuser vanes at a rate for effecting an apparent curvature on the diffuser vane surfaces sufficient to most efficiently handle the flow rate to meet the demand.

4,228,754

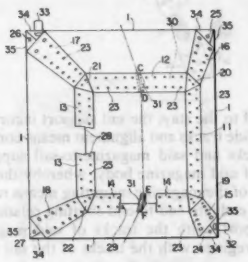
OIL/WATER STORAGE TANK HAVING FLEXIBLE PARTITION MEMBRANE AND CHAMFERED INTERNAL EDGES AND CORNERS

Yutaka Shibata; Nobuyuki Tanaka, and Ichiro Maruyama, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 13, 1978, Ser. No. 886,013

Int. Cl.[3] B63B *25/12*

U.S. Cl. 114—74 R 4 Claims



1. In a tank for the storage and/or transportation of two different fluids, such as crude oil and ballast water, having walls and including a flexible partition membrane disposed within the tank for separating it into two different, variable volume compartments for the respective fluids to thereby prevent their mutual mixing and contamination, and ports provided in the walls of the tank communicating with each compartment for the intake/discharge of said fluids the improvement characterized by:

perforated plate means disposed on the interior of said tank to chamfer the edges and corners of the walls of the tank and to shield said ports from said membrane, thereby preventing said membrane from blocking any of said ports during the final stages of a fluid supply or discharge operation, said ports for the intake and/or discharge of the fluids communicating with respective compartments through spaces defined between said perforated plate means and the walls of the tank.

4,228,755

SAIL SUPPORTS

Robert G. Graham, 12 Half Moon Rise, Bucklands Beach, Auckland, New Zealand

Filed Dec. 13, 1978, Ser. No. 969,171

Claims priority, application New Zealand, Dec. 14, 1977, 185968; Apr. 28, 1978, 187110

Int. Cl.[3] B63H *9/10*

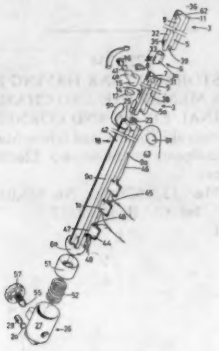
U.S. Cl. 114—111 7 Claims

1. A stay rigged sail change-over magazine comprising: an elongate magazine body incorporating at least two parallel and longitudinally extending sail slide tracks thereon, the tracks terminating coterminously with one end of the magazine body, said one end being formed with magazine-to-sail support alignment means;

a pair of longitudinally spaced apart stops mounted to each

track of the magazine which prevent passage of sail slides along the track beyond the stops, with the stop nearest the alignment means on each track being detachable;

and a magazine body mounting means clampable to a stay, said mounting means incorporating a spring loaded magazine-body-end receiving element whereby the magazine body can be detachably mounted between the magazine body mounting means and a lower end of a sail support



mounted to the stay, the sail support incorporating parallel sail slide tracks and alignment means complementary to said tracks and said magazine-to-sail support alignment means of said magazine body, whereby the spring loaded element of the magazine mounting means resiliently biases said one end into end-to-end abutting relationship with the sail support, with the tracks of said magazine body in aligned register with the tracks of the sail support.

4,228,756

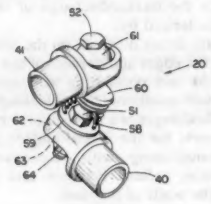
CATAMARAN TILLER-CROSSBAR CONNECTOR

John E. Storer, Jr., Indianapolis, Ind., assignor to Sailing Systems, Inc., Lexington, Tenn.

Filed Feb. 1, 1979, Ser. No. 8,695

Int. Cl.³ B63H *25/00*

U.S. Cl. 114—144 R **14 Claims**



1. A tiller-crossbar connector for connecting together a tiller arm and an adjacent crossbar end cap for catamaran rudder control which comprises:

a recess in said end cap;

a central shaft member extending through said crossbar end cap;

a part-spherical pivot member slidably received by said central shaft member and positioned between one end of said central shaft member and said crossbar end cap;

means for anchoring said central shaft member to said tiller arm;

spring means disposed about said central shaft member and acting between said end cap and said tiller arm to urge said pivot member into said end cap recess; and

said central shaft member having a first portion of a smooth cylindrical surface and a second portion externally threaded, said first portion extending through said part-spherical pivot member, and said first and second portions having axes which are arranged at an angle to one another.

4,228,757

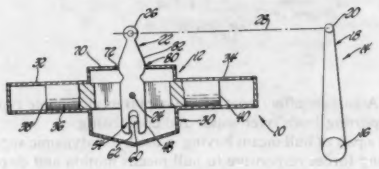
BOAT STEERING ASSEMBLY

Robert A. R. Wood, West Vancouver, Canada, assignor to Teleflex Incorporated, Limerick, Pa.

Filed Jul. 21, 1978, Ser. No. 926,662

Int. Cl.³ B63H *25/22*

U.S. Cl. 114—150 **19 Claims**



1. A boat steering assembly comprising; boat steering means including a tiller lever having a first end and a second end for providing a steering input upon being pivoted about a first pivot axis; said tiller lever extending from said first axis to said second end, actuator means including an actuating lever, having a first end and a second end supported for pivotal movement about a second pivot axis, said actuating lever extending from said second pivot axis to said second end, linkage means interconnecting said second ends of said levers for pivoting said tiller lever upon pivoting movement of said actuating lever and for positioning said levers in parallel relationship with one another in a neutral position, said tiller lever being longer in length between said first pivot and said second end thereof than the length of said actuating lever between said second pivot and said second end thereof so that said tiller lever rotates a smaller angle than said actuating lever in response to rotation thereof from said neutral position by said actuating lever.

4,228,758

LABELLED BOTTLE-BOAT FENDER

Peter G. Dornau, 9290 SW. 117th Ter., Miami, Fla. 33156, and Arthur Spector, 254 Seaview Dr., Key Biscayne, Fla. 33149

Filed Mar. 23, 1979, Ser. No. 23,124

Int. Cl.³ B63B *59/02*

U.S. Cl. 114—219 **2 Claims**

1. A bottle-boat fender formed of plastic and comprising a hollow body for holding a flowable material therein and including a top wall portion, having an opening communicating with the interior of the body, closure means releasably secured to the opening, a bottom wall portion and a sidewall disposed between the top wall and bottom wall and forming the periphery of the body, said sidewall being relatively thin and including a first pair of opposed wall portions, and a second pair of opposed wall portions, each of the wall portions of said first

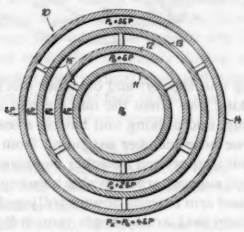
and second pairs merging together at respective corners, each of the opposed wall portions of said first pair including at least one tapered depression therein, each depression including an upper and a lower conically shaped surface and a pair of planar surfaces extending between corresponding ends of said conical surfaces, said planar surfaces being spaced from said corners to reduce stress concentrations thereat, each of said depressions tapering downward in cross-section towards its bottom, with the depression in one wall portion being aligned with a similarly constructed depression in the opposed wall portion, the bottom of the opposed aligned depressions forming a common wall having an aperture therein of sufficient size to accommodate a section of nautical rope therethrough, said aligned depressions being located below the top wall and above the bottom wall of said body, and removable label means in the form of a heat-shrunk plastic band frictionally engaged on the periphery of said sidewall and disposed over said depressions to give the bottle-boat fender a conventional merchandising bottle-like appearance, said label comprising an opaque portion bearing printed indicia and a transparent panel window portion located only over said first pair of opposed wall portions for exposing to view at least one of said depressions.

4,228,759

PRESSURE-SUSTAINING VESSEL

Masanobu Shinozuka, 229 Oak St., Ridgewood, N.J. 07450

Filed May 5, 1978, Ser. No. 903,061
Int. Cl.[2] B63G *8/00*
U.S. Cl. 114—342 **6 Claims**



1. A vessel for deep-sea diving designed to sustain a pressure differential between its interior and its surroundings, comprising:

a hull formed from a multiplicity of concentrically nested shells including an innermost shell and several outer shells separated by intervening fluid-filled clearances;

sensing means in said hull for determining the pressure prevailing in each of said clearances; and

pressure-control means responsive to said sensing means for admitting sea water from outside said hull into said clearances under pressures corresponding to a fractional value of the overall pressure differential between the interior of the innermost shell and the outside, the sum of the water pressures in said clearances equaling said overall pressure differential.

4,228,760

REMOTE CONTROLS FOR MARINE ENGINE EMPLOYING ROTATABLE FLEXIBLE SHAFTS

Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 28, 1979, Ser. No. 15,829
Int. Cl.[3] B63H *1/14, 5/06*
U.S. Cl. 440—86 **5 Claims**

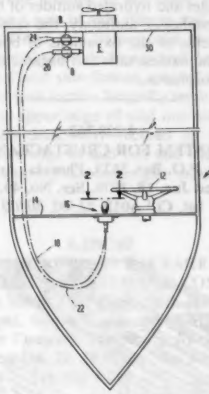
1. In a marine engine having a throttle for controlling speed of said engine and a shift actuator for controlling direction of rotation of propeller shaft of said engine, the combination therewith of the improvement for remotely controlling said throttle and shift actuator from the helm of a marine vessel by application of opposed manipulatively distinguishable arcuate motions to respective controls for said throttle and shift actuator, comprising

a throttle control knob and a shift actuator control knob supported for individual opposed arcuate co-planar movement at said helm,

a driver pulley associated with each of said knobs and turned at its periphery by its associated control knob upon arcuate movement thereof,

a driven pulley rotating in stepped-up response to rotation of each of said driver pulleys,

a housing including a control panel front plate having opposed arcuate guideway slots therethrough defining range of movement of respective knobs and an interior partition having an arcuate guideway slot optically aligned with one of said front plate guideway slots, said partition dividing said housing into two compartments, a driver-driven pulley pair in each compartment, mounted at said helm for



rotatably mounting said driver pulleys and said driven pulleys,

control rods connecting the peripheries of respective driver pulleys with respective control knobs, one rod passing through said optically aligned guideway slots in said front plate and said partition and a second rod passing through said remaining guideway slot in said front plate, respective control rods being movable transversely to said front plate within their respective slots unitarily with respective control knobs in response to operator applied movement thereof,

thrust bearing means separating respective driver pulleys from said interior partition and a rear panel of said housing,

a rotatable flexible shaft connected co-axially to each of said driven pulleys for unitary rotation therewith, and

means converting rotary motion of each of said flexible shafts into linear motion for control of said throttle and shift actuator.

4,228,761

METHOD FOR COATING A POLYMERIC ARTICLE WITH A THERMOCHROMIC PAINT

Leon C. Glover, Los Altos, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 805,007, Jun. 9, 1977, Pat. No. 4,121,011, which is a division of Ser. No. 635,951, Nov. 28, 1975, Pat. No. 4,105,583, which is a continuation-in-part of Ser. No. 460,124, Apr. 11, 1974, abandoned. This application Sep. 14, 1978, Ser. No. 942,295

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[3] C09K *3/00;* C09D *5/26;* G01K *11/14*

U.S. Cl. 116—201 11 Claims

1. In a method for indicating the temperature to which a heat-deformable polymeric material subject to oxidative degradation is heated comprising the step of applying a thermochromic paint thereon, the thermochromic paint containing a thermochromic pigment comprising a metallic compound, the improvement comprising the step of inhibiting degradation of the polymeric material by adding to the paint a non-thermochromic compound in amounts effective to inhibit degradation of said polymeric material by the thermochromic pigment, said non-thermochromic compound selected from the group consisting of the sulfates, hydrated sulfates and nitrides of boron, aluminum, tin, lead, arsenic, antimony, bismuth, zinc and phosphorus; the sulfides and hydrated sulfides of boron, aluminum, bismuth and phosphorus; antimony; the salts, organic derivatives and free acids of the oxyanions of boron, arsenic, and antimony; and the oxides, salts and organic derivatives of the oxyanions of phosphorus.

4,228,762

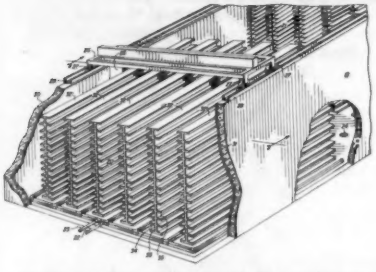
GROWTH SYSTEM FOR CRUSTACEANS AND FISH

James M. Kemp, P.O. Box 5623, Phoenix, Ariz. 85010

Filed Jun. 18, 1979, Ser. No. 49,172

Int. Cl.[3] A01K *61/00, 80/00*

U.S. Cl. 119—2 6 Claims



1. An apparatus for growing and processing crustaceans and fish comprising:

an elongated tank arranged in a substantially horizontal position,

a plurality of reefs spacedly arranged in said tank longitudinally thereof,

each of said reefs comprising a plurality of tiers spacedly arranged laterally of the longitudinal axis of said tank in a substantially vertical array,

said reefs providing a plurality of spaced habitats for the crustaceans and fish,

means mounted along the base of said tank longitudinally thereof for aerating the water in said tank,

each of said reefs comprising a vertically arranged member extending from the base of the tank toward its top and having a plurality of pairs of shelves extending laterally thereof in a common plane with each pair of shelves forming a substantially horizontally arranged tier, and

harvesting means mounted for movement on the top of said tank and along its length for accumulating crustaceans and fish of a predetermined size residing along said tiers at a point in said tank,

said harvesting means comprises a boom extending laterally across the width of said tank and having a plurality of brush structures spacedly arranged along its length for extending vertically into said tank toward its bottom one adjacent each of said tiers.

4,228,763

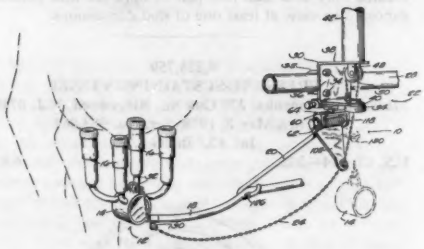
MILKING UNIT SUPPORT AND DETACHER MECHANISM

Robert F. Heidecker, and Edward D. Harwood, both of Longmont, Colo., assignors to Dairy Systems, Inc., Longmont, Colo.

Filed May 3, 1978, Ser. No. 902,354

Int. Cl.[3] A01J *5/04, 7/00*

U.S. Cl. 119—14.08 18 Claims



1. A milking unit support and detacher mechanism for supporting a milking unit when the milking unit is attached to a cow for milking, said milking unit having a teat cup assembly and at least one hose member extending from said assembly, the milking unit support and detacher mechanism comprising:

a milking unit support arm movable between a first position wherein said arm extends downwardly and a second position wherein said arm extends outwardly, said milking unit support arm having a free end engageable with said hose member in spaced relation to said teat cup assembly for supporting said milking unit when the milking unit is attached to a cow for milking and when said arm is in said second position; and

support means for said milking unit support arm including first means disposed for rotation about a vertical axis and second means disposed for pivotal movement about a generally horizontal axis, and said milking unit support arm attached to one of said first and second means for movement about said vertical axis and said horizontal axis.

4,228,764

MILKING UNIT SUPPORT AND DETACHER MECHANISM

Carl E. Plett, Chino, Calif., assignor to Dairy Systems, Inc., Longmont, Colo.

Filed May 3, 1978, Ser. No. 902,355

Int. Cl.[3] A01J *7/00*

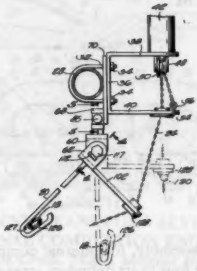
U.S. Cl. 119—14.08 7 Claims

1. A milking unit support mechanism for supporting a milking unit when the milking unit is attached to a cow for milking and comprising:

a milking unit support arm having an end for supporting a milking unit; and

means for supporting said milking unit support arm such that said end for supporting said milking unit is releasably held beneath the cow in a first position, said supporting means including means for supporting said support arm for pivotal movement about a generally vertical axis, said sup-

porting means including a generally vertical shaft rotatable about said vertical axis and supporting said support arm and means for biasing said arm forwardly when said arm is pivoted about said vertical axis from said first position toward a position rearwardly of said first position and for biasing said arm rearwardly when said arm is pivoted about said vertical axis from said first position toward a position forward of said first position, said vertical shaft being freely rotatable about said vertical axis except when



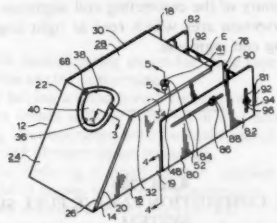
said arm is between said position rearwardly of said position and said position forward of said first position said generally vertical shaft including a generally vertical planar face and said biasing means including a engaging member having a generally planar face for engaging said vertical planar face when said support arm is in said first position, and means for releasably biasing said engaging member toward said vertical shaft and into engagement with said vertical planar face of said shaft.

4,228,765

RABBIT RESTRAINING BOX

Carter H. Berlin, Alta Loma, Calif., assignor to Joseph B. Michaelson, Glendale, Calif.

Filed Oct. 23, 1978, Ser. No. 953,767
Int. Cl.³ A61D *3/00*; A01K *15/04*
U.S. Cl. 119—98 **16 Claims**



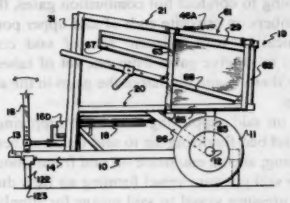
1. Rabbit box apparatus for laboratory rabbits, comprising a box having: a bottom wall; a pair of opposed side walls; and a front wall having a rabbit neck-receiving opening, said front wall being connected to said bottom and side walls to define a rabbit enclosure; a top wall hinged to one of said side walls to open or close said enclosure in rabbit receiving and restraining relation respectively; and box back plate means for engaging the hind leg feet of a rabbit restrained in said box, said back plate means including a bar extending transversely of said enclosure opposite said front wall, said box back plate means further comprising a three-sided frame longitudinally interfitting said box bottom and side walls, and including also fasteners securing said frame to said box walls in back plate bar positioning and enclosure extension-delimiting relation.

4,228,766

TRUCK MOUNTED CATTLE CONTROL BOX

Martin Wedman, Gen. Del., New Fish Creek, Alberta, Canada

Filed Feb. 16, 1979, Ser. No. 12,608
Claims priority, application Canada, Feb. 17, 1978, 297353
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—103 **8 Claims**



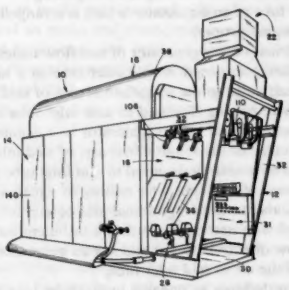
1. An animal control box assembly comprising in combination a wheeled trailer, including a frame, a hitch on the front end of said frame, and a control box pivotally mounted upon said frame for movement from a vertical, animal entering and leaving position, to a substantially horizontal animal treatment position and vice-versa, and means on said frame to move said control box from one position to the other, said control box assembly including a pair of side frames and a head squeeze gate at one end of said side frames, said head squeeze gate being hinged to one of said side frames and detachably latchable to the other of said side frames, one of said side frames including an upper gate section hingedly secured by the upper side thereof to the upper edge of said one side frames and a lower gate section detachably secured by the lower side thereof to the lower edge of said one said frame, and detachable latch means securing said upper gate section to said lower gate section.

4,228,767

SELF CONTAINED BOILER PACKAGE UTILIZING ATMOSPHERIC FLUIDIZED BED COMBUSTION

Willard P. Smith; Harry J. Michaels, both of Spring Lake, and Robert W. Shedd, Grand Rapids, all of Mich., assignors to Johnston Boiler Company, Ferrysburg, Mich.

Filed Jan. 22, 1979, Ser. No. 5,072
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—4 D **9 Claims**



1. A unitized fluidized bed combustion fire tube boiler assembly comprising:

a supporting frame having a platform base and skeletal structure thereon;

a pressure vessel on said frame, having a lower upright portion with upright walls, and an upper horizontal portion, both portions collectively defining a water and steam chamber;

a fluidized bed combustion housing in said lower upright portion, spaced inwardly from said pressure vessel upright walls; a distributor in said housing, having fuel inlets and combustion and suspension air inlets;

a plurality of sets of horizontal, spaced, elongated, combustion-gas tubes in said pressure vessel upper portion, in flow communication with said fluidized bed combustion housing to conduct hot combustion gases, flow reversing chambers on opposite ends of said upper portion, in communication with adjacent sets of said combustion-gas tubes to receive gases from one set of tubes, reverse the flow thereof, and discharge the gases in the adjacent set of tubes;

means on said supporting frame for supplying combustion air and bed fluidizing air to said fluidized bed combustion housing; and an enclosure on said frame about and spaced from said pressure vessel forming air flow ducting around said pressure vessel to said means for supplying combustion air and fluidizing air, thereby preheating the air thereto.

4,228,768

AIR INDUCTION APPARATUS FOR USE WITH KARMAN VORTEX SHEDDING FLOW METER

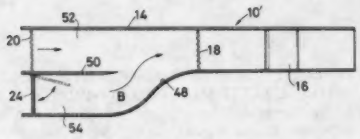
Toru Kita, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 14, 1978, Ser. No. 924,681

Claims priority, application Japan, Jul. 25, 1977, 52-99302[U]

Int. Cl.³ F02B *3/00*; G01F *1/32*

U.S. Cl. 123—494 **12 Claims**



1. An air induction apparatus for feeding a combustion engine with air which is metered by using a Karman vortex shedding flow meter to control as a result of this meterage the amount of fuel fed to the engine, comprising:

an inlet tube of an air cleaner which is arranged upstream of the engine proper;

a cylindrical vortex generator of said flow meter, said generator being disposed in said inlet tube in a manner to be perpendicular to the longitudinal axis of said inlet tube;

a first wire netting disposed in said inlet tube at a position upstream of said vortex generator in a manner to be perpendicular to the longitudinal axis of said inlet tube;

a second wire netting disposed in said inlet tube at a position upstream of said first wire netting in a manner to be perpendicular to the longitudinal axis of said inlet tube, said second wire netting producing a turbulent but uniformed air flow directed toward said vortex generator upon flowing of the air in said inlet tube;

means for defining an opening in said inlet tube at a position upstream of said first wire netting;

a damper door swingably connected to said inlet tube to selectively open and close said opening; and

damper door operator for operating said damper door in such a manner that under low speed operation of the engine, the damper door closes said opening, and under high speed operation of the engine, the damper door opens said opening.

4,228,769

INTAKE-PIPE ARRANGEMENT FOR IN-LINE INTERNAL COMBUSTION ENGINES

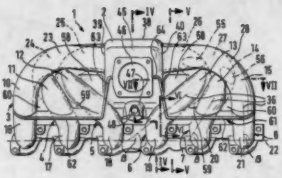
Jurij Gartner, Germering; Helmut Hengl; Karl Sixt, both of Munich, and Reinhard Woltmann, Puchheim, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,977

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711195

Int. Cl.³ F02B *75/18*

U.S. Cl. 123—52 M **22 Claims**



1. Intake-pipe assembly, for internal combustion engines of the type including four to six cylinders arranged in a line or the like, comprising:

an intake manifold;

and a plurality of intake pipes of substantially similar total lengths extending from said intake manifold in approximately one plane, pairwise and opposite one another,

each of said intake pipes including a manifold end segment, a connecting end segment having an extreme end portion attachable to inlet channel means of an engine and a curved intermediate segment interconnecting the respective manifold end segments and connecting end segments, the connecting end segments being arranged approximately parallel to one another and approximately at right angles to the manifold segments emerging from the intake manifold,

wherein said intermediate segments overlap one another and extend pairwise in respective intermediate segment planes intersecting said one plane at different angles, said intermediate segment planes being angularly inclined with respect to one another and intersecting with one another in the vicinity of the connecting end segments in a common intersection area which runs at right angles to the connecting end segments.

4,228,770

INTERNAL COMBUSTION ENGINE FUEL SUPPLY SYSTEM

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

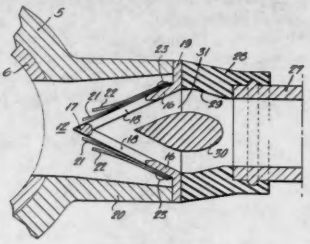
Filed May 29, 1979, Ser. No. 42,803

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—73 V **16 Claims**

1. An internal combustion engine having a fuel inlet port and having fuel supply means, the fuel supply means including passage walls defining a fuel passage communicating with the inlet port and having reed valve means in the passage to control the flow of fuel through the passage, the valve means comprising a ported valve seat and a cooperating reed valve, the cross-sectional area within the passage walls being relatively large in a first region at the upstream side of the valve means as compared with a second region farther upstream, and an element positioned in said relatively large region, said ele-

ment having a cross-sectional area in a plane transverse to the fuel passage sufficient to substantially reduce the effective



cross-sectional flow area in said region of relatively large cross-sectional area.

4,228,771

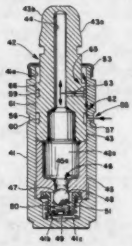
LASH ADJUSTMENT MEANS FOR VALVE GEAR OF AN INTERNAL COMBUSTION ENGINE

John J. Krieg, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 779,219, Mar. 18, 1977, abandoned, which is a continuation of Ser. No. 606,632, Aug. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 550,785, Feb. 18, 1975, abandoned. This application Feb. 28, 1978, Ser. No. 882,305

Int. Cl.[2] F01L *1/24*

U.S. Cl. 123—90.55 **24 Claims**



1. Hydraulic lash adjusting means for valve gear of an internal combustion engine comprising:

(a) a body having a blind bore formed therein;

(b) plunger means slidably received in said body bore and defining, in cooperation with the blind end of said bore, a cavity, said plunger means including,

(i) means defining a pivot surface adapted to contact associated engine valve gear components,

(ii) means defining a fluid reservoir, and

(iii) one-way valve means permitting fluid flow from said reservoir to said cavity;

(c) said body including inlet port means communicating with said bore and adapted for receiving fluid under pressure therein;

(d) means defining a fluid passage communicating with said port means and exclusively providing fluid communication therefrom with said reservoir, said passage defining means including primary fluid metering means continuously metering all fluid to said reservoir, said primary metering means including a first annular collector groove and a first annular metering land fluidically downstream of said collector groove;

(e) pressure relief means communicating with said fluid passage, said pressure relief means including secondary metering means including a second annular collector groove and a second annular metering land downstream of said second collector groove for metering fluid flow from said passage to the atmosphere wherein said first metering land is intermediate said first and second collector groove; and,

(f) means biasing said plunger means outwardly of said cavity.

4,228,772

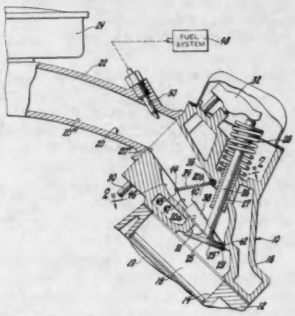
LOW THROTTLED VOLUME ENGINE

Stephen M. Bakonyi, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 1, 1979, Ser. No. 8,237

Int. Cl.[3] F02D *9/02*; F02M *39/00*; F01L *3/06*

U.S. Cl. 123—403 **3 Claims**



1. In an internal combustion engine, a combustion chamber having an intake port, an intake valve operable to open and close said intake port, and a single-throttle air-fuel delivery system for delivering a throttled air-fuel mixture to said intake port comprising an intake passage having an inlet end open to an air supply and an outlet end connected to said intake port, dividing means separating said intake passage into separate small and large flow area passages forming a throttled portion extending from said intake port having a short length as compared to the remaining unthrottled length of said intake passage, fuel supply means for supplying fuel to said intake passage a location upstream of its division, and a single throttle valve in said intake passage adjacent said intake port and upstream of said dividng means for throttling both said small and large flow area passages so that at small throttle valve openings at least substantially all the air-fuel mixture is caused to flow through said small flow area passage to said intake port at a substantially increased velocity relative to that upstream of said throttle valve and without substantial dissipation and at large throttle valve openings the air-fuel mixture is caused to flow through both of said small and large flow area passages to said intake port whereby air-fuel mixture is delivered to said intake port throughout the range of throttle valve openings by the cooperation between said throttle valve and said small and large flow area passages while the pressure upstream of said throttle valve and adjacent said intake port is maintained substantially atmospheric by virtue of said short throttled portion to minimize engine pumping loss.

4,228,773

DEVICE TO ACTIVATE AN ADJUSTING MEMBER IN DEPENDENCE ON LOAD

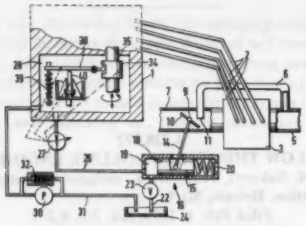
Gerhard Stumpp, Stuttgart, and Gerhard Schielinsky, Schwaikheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1977, Ser. No. 861,378

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658052

Int. Cl.³ F02M *25/06, 63/00*

U.S. Cl. 123—505 **21 Claims**



1. In a fuel injection system for an internal combustion engine, comprising in combination:

a. an intake manifold through which an air flow is established;

b. an exhaust gas line through which an exhaust gas flow is established;

c. an exhaust gas recycling line connected to the exhaust gas line and to the intake manifold; the intake manifold connection defining therein a discharge outlet of the recycling line;

d. a first throttle valve controlling the flow of the exhaust gas in the recycling line;

e. fuel injection pump having a fuel rate adjusting structure which is adjustable according to engine rpm;

f. a servomotor including an adjusting element, an operating pressure chamber, a return means to provide a biasing force and means connecting the adjusting element to the first throttle valve for controlling the opening thereof;

g. a fuel line connecting the fuel injection pump and the servomotor through which a flow rate is established where the flow rate determines the actuation of the servomotor;

h. a second throttle valve located in the fuel line having an actuating means wherein the second throttle valve is connected to the fuel rate adjusting structure by the actuating means, such that the second throttle is controlled according to engine rpm by the fuel rate adjusting structure to determine the flow rate in the fuel line.

4,228,774

CONTROL APPARATUS FOR SUPERCHARGED FUEL INJECTION ENGINES

Ernst Ritter, Stuttgart; Josef Trui, Bietigheim-Bissingen, and Manfred Krämer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,403

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731107

Int. Cl.³ F02D *1/06*

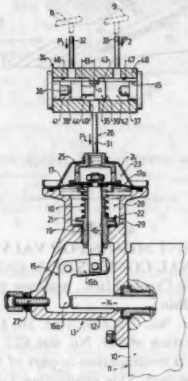
U.S. Cl. 123—562 **9 Claims**

1. A control apparatus for supercharged fuel injection internal combustion engines such as diesel engines having two induction tubes and a fuel measurement apparatus having a delivery-amount adjustment member and provided with adjustable means for varying the range of the full-load position of said delivery-amount adjustment member of said fuel measurement apparatus, return means and charge-air pressure responsive means movable against the force of said return means connected to the adjustable means comprising,

a pair of intake pressure lines each connected to one of the induction tubes of the engine,

a switch valve having an interior defining a pair of separately disposed control chambers each of said control chambers connected to one of said intake pressure lines,

a control line for connecting said switch valve to a pressure



chamber to which said charge-air pressure responsive means is exposed,

a valve member disposed in said switch valve interior for movement by the higher of the charge-air pressures in one of the control chambers into a position for communication of the intake pressure line having the lower charge-air pressure through the control line with the pressure chamber to which the charge-air pressure responsive means is exposed.

4,228,775

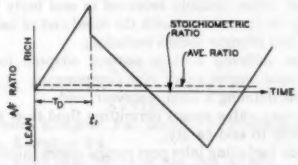
CLOSED LOOP AIR/FUEL RATIO CONTROLLER WITH ASYMMETRICAL PROPORTIONAL TERM

John F. Schweikert, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1978, Ser. No. 961,645

Int. Cl.³ F02M *7/00;* **F02B** *3/00*

U.S. Cl. 123—440 **1 Claim**



1. An air/fuel mixture control system for an internal combustion engine having combustion space into which an air/fuel mixture is supplied to undergo combustion and having means defining an exhaust passage from the combustion space into which spent combustion gases are discharged and directed to the atmosphere comprising, in combination:

an air/fuel mixture supply means effective to supply a mixture of fuel and air to the combustion space;

sensor means effective to sense the oxidizing/reducing conditions at a predetermined point in the exhaust passage and hence, after a transport delay period dependent upon engine operating conditions, to the mixture supplied to the

combustion space, the sensor means providing a sensor signal indicative of the sense of deviation of the air/fuel ratio of the mixture supplied to the combustion space from a predetermined ratio;

a control circuit responsive to the sensor signal effective to generate a control signal; and

means effective to control the air/fuel ratio of the mixture supplied by the air/fuel mixture supply means in accord with the instantaneous value of the control signal,

the control circuit including an integrator responsive to the sensor signal effective to provide an asymmetrical integral term portion of the control signal to effect a shift in the average value of the control signal in one direction from the value producing the predetermined ratio by an amount dependent in part by the value of the transport delay and

a proportional circuit effective to provide an asymmetrical proportional term portion of the control signal to effect a shift in the average value of the control signal in the direction opposite said one direction by an amount dependent in part upon the value of transport delay, the shift in the average value of the control signal being dominated by the asymmetrical integral term portion of the control signal at large values of the transport delay and the shift in the average value of the control signal being dominated by the asymmetrical proportional term portion of the control signal at small values of the transport delay so that the average value of the air/fuel ratio of the mixture supplied to the engine varies from the predetermined ratio in one sense changing to the opposite sense as the engine operating conditions change thereby varying the transport delay through the engine between high and low values to thereby effect a scheduled offset in the air/fuel ratio in accord with engine operating conditions.

4,228,776

FUEL FEED SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

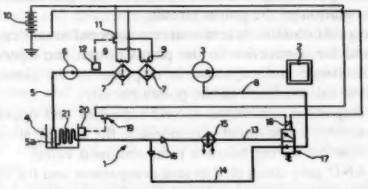
Bruno Gallione, Rivalta, and Carlo Frascisco, Turin, both of Italy, assignors to Fiat Veicoli Industriali S.p.A., Turin, Italy

Filed Mar. 23, 1979, Ser. No. 23,503

Claims priority, application Italy, Apr. 17, 1978, 67855 A/78

Int. Cl.[3] **F02M** *31/00*

U.S. Cl. 123—549 **4 Claims**



1. In a fuel feed system for an internal combustion engine, of the type comprising:

a fuel tank,

an injection pump,

a fuel feed duct leading from said fuel tank to said injection pump for feeding fuel to said internal combustion engine,

a fuel feed pump in said fuel feed duct for feeding fuel from said fuel tank to said injection pump,

at least one fuel filter in said fuel feed duct upstream of said injection pump, and

a return duct leading back to said fuel tank for excess fuel fed by said fuel feed pump to said injection pump,

the improvement wherein

said fuel filter is provided with an electrical resistance,

a first electrical switch,

a first temperature sensor positioned to sense the temperature of the fuel in said fuel feed duct at a point upstream of said filter,

said electrical resistance operating, when energised, to heat by the Joule effect fuel passing through said filter, and being connectable to an electrical source by means of said first electrical switch the closing and opening of which is controlled by said first temperature sensor in such a way that said first electrical switch is closed when the temperature of the fuel at said point upstream of said filter is lower than a first threshold value,

a solenoid valve having an inlet in said return duct downstream of said injection pump, and two outlets,

first and second branch ducts connected to said outlets, said first branch duct leading in to said fuel tank, an end portion of said first branch duct being of sinuous form within said fuel tank and said second branch duct joining said first branch duct upstream of said tank

said solenoid valve operating selectively to direct fuel flowing in said return duct into one or other of said first and second branch ducts connected to said two outlets thereof,

a heater in said first branch duct,

a second electrical switch,

a second temperature sensor positioned to sense the temperature of the fuel in the fuel tank, said solenoid valve being electrically connectable to the electrical source by means of said second electrical switch the closing and opening of which is controlled by said second temperature sensor in such a way that fuel is directed by said solenoid valve into said firs: branch duct when the second sensor senses that the temperature of the fuel in said tank is lower than a second threshold value, which is higher than said first threshold value.

4,228,777

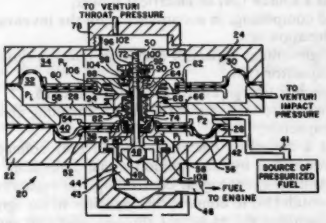
FUEL CONTROL

Elmer A. Haase, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 1, 1979, Ser. No. 8,625

Int. Cl.[3] **F02D** *1/04;* **F02M** *39/00;* **F16K** *31/126*

U.S. Cl. 123—454 **12 Claims**



1. In a fuel control apparatus having a valve fixed to a first diaphragm and connected to a second diaphragm by a linkage arrangement, said first diaphragm separating a fuel section into a fuel flow chamber and a fuel supply chamber, said second diaphragm separating an air section into an airflow chamber and a static air chamber, said second diaphragm responding to mass airflow to an engine that creates an airflow pressure differential between the airflow chamber and the static chamber to provide the linkage arrangement with an air input force for moving the valve with respect to a seat and allow fuel to flow from the fuel flow chamber, the fuel flow from the fuel flow chamber creating a fuel flow pressure differential between the fuel flow chamber and the fuel supply chamber to develop a fuel input force that acts on the first diaphragm to oppose the air input force and thereby match the fuel flow from the fuel flow chamber with the mass air flow to establish a fuel to air ratio corresponding to the optimum operational parameter of the engine, the improvement comprising:

adjustment means connected to the linkage members for balancing internal spring forces associated with first and

second diaphragms to assure that the fuel flow from the fuel chamber is zero when the mass airflow to the engine is zero.

4,228,778

EXTENDED SPARK CAPACITOR DISCHARGE IGNITION SYSTEM

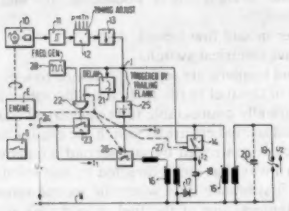
Friedrich Rabus, Schwieberdingen, and Günter Gräther, Pinache, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,802

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742641

Int. Cl.³ F02P *3/00*

U.S. Cl. 123—605 **10 Claims**



1. Extended spark composite capacitor discharge and ignition coil electromagnetic storage ignition system for an internal combustion engine (E) having

ignition signal generating means (**10—13**) coupled to the engine (E) and providing an ignition event signal at a predetermined angular position of the crankshaft of the engine,

an ignition coil (**15**) having a primary and secondary, and at least one spark gap (**19**) connected to the secondary of the ignition coil,

and a source (**24**) of electrical power,

and comprising, in accordance with the invention, the combination of

a high-voltage capacitor discharge ignition system including a capacitor (**18**);

capacitor charge control circuit means (**16, 17, 26, 27**) connected to said source (**24**) and controlling charging of the capacitor;

and a capacitor discharge switch (**14**) connected to and controlled by said ignition signal generating means, said ignition event signal controlling the capacitor discharge switch (**14**) to connect the capacitor to the ignition coil to discharge the capacitor through said coil and initiate an ignition event;

with

an extended spark electromagnetic storage discharge system including

a coil current control switch (**23**) connected to said source (**24**) controlling current flow to the ignition coil (**15**);

and a pulse control generation means (**28**) controlling generation of a plurality of extended spark discharge signals, and controlling closing of said current control switch (**23**) to close repetitively to permit current flow through the primary of the ignition coil from said source independently of current flow therethrough upon discharge of the capacitor, and under command of said pulse control generation means,

said ignition signal generating means further being connected to control the first closing of said coil current control switch (**23**) to occur under control of said ignition signal generating means and as a function of said ignition event signal;

and further comprising a delay circuit (**21**) coupled to and controlled by the ignition signal generating means and controlling said coil current control switch (**23**) to delay closing thereof until the capacitor (**18**) has discharged upon operation of the capacitor discharge switch (**14**) to provide for an initial spark of the spark gap generated by energy derived from the capacitor (**18**) and subsequent sparks at the spark gap (**19**) under control of said pulse control generation means.

4,228,779

PROCESS AND A CIRCUIT ARRANGEMENT FOR THE CONTROL OF THE PRIMARY CURRENT IN COIL IGNITION SYSTEMS OF MOTOR VEHICLES

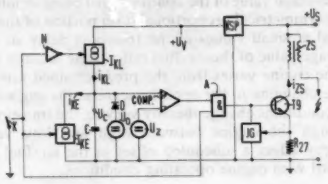
Klaus Wetzel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,791

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2747819

Int. Cl.² F02P *1/08*; H05B *41/14*

U.S. Cl. 123—652 **10 Claims**



1. A circuit arrangement for controlling the current through the primary winding of an ignition coil of a motor vehicle in response to the open and closed time intervals of a cyclically operating points circuit and substantially independent of engine speed, supply voltage and the internal resistance of the ignition coil, comprising:

a capacitor;

a first constant current source connected to said capacitor and for connection to the points circuit and operable to charge said capacitor in response to the open time interval condition of the points circuit;

a second constant current source connected to said capacitor and for connection to the points circuit and operable to discharge said capacitor in response to the closed time interval condition of the points circuit;

a comparator connected to said capacitor and operable to produce a first signal in response to the voltage across said capacitor falling below a predetermined value;

an AND gate connected to said comparator and for connection to the points circuit and operable to produce a second signal in response to said first signal in conjunction with the closed time interval condition of the points circuit;

a resistor;

transistor means including an emitter circuit connected to a reference potential by way of said resistor, a collector circuit for connection to the supply voltage by way of the primary winding, and a base circuit connected to said AND gate, said transistor activated in response to said second signal to cause current to flow in series through said resistor and the primary winding; and

a current limiting circuit connected to said resistor and said base circuit to hold said second signal constant in response to the voltage across said resistor reaching a predetermined value,

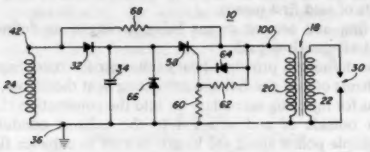
said current limiting circuit comprising a transistor including a base-emitter circuit connected in parallel with said resistor, and a collector connected to said base circuit of said transistor means.

4,228,780

CAPACITOR DISCHARGE IGNITION SYSTEM WITH TIMING CONTROL ARRANGEMENT

Ronald J. Kiess, Decator, Ind., assignor to Wabash, Inc., Wabash, Ind.

Filed Feb. 22, 1979, Ser. No. 14,141
Int. Cl.³ F02P 3/08, 3/06
U.S. Cl. 123—596 **16 Claims**



1. In a capacitor discharge ignition system for use with a rotating permanent magnet including two poles that is rotated over a path in synchronism with the operation of an engine, the combination of:

means positioned adjacent the path of the permanent magnet for generating a charging supply and for generating a triggering signal in response to induced voltages and currents resulting from the rotating permanent magnet, said generating means comprising a core of ferromagnetic material, and a control winding disposed on said core and having induced therein a voltage and current of a first polarity to generate said charging supply in response to the passage of a first pole of the magnet and having induced therein a voltage and current of opposite polarity to said first polarity to generate said triggering signal in response to passage of the second pole of said magnet;

storage means connected to said generating means and being charged in response to said charging supply for storing said energy delivered from said charging supply;

ignition coil means disposed on said core for receiving energy and for generating an ignition voltage in response to said received energy; and

means independent of said storage means and said generating means responsive to said triggering signal for controlling the discharge of said storage means into said ignition coil means, said controlling means comprising circuit means and electronic switch semiconductor means having anode, cathode and control connections, said anode being connected to said storage means and said cathode being connected to said ignition coil, said circuit means providing a first resistive circuit path between one end of said control winding and said control connection of said electronic switch semiconductor means and a second resistive circuit path between the second end of said control winding and said cathode of said electronic switch semiconductor means.

10. In a capacitor discharge ignition system for use with a rotating permanent magnet including two poles that is rotated over a path in synchronism with the operation of an engine, the combination of:

means positioned adjacent the path of the permanent magnet for generating a charging supply and for generating a triggering signal in response to induced voltages and currents resulting from the rotating permanent magnet, said generating means comprising a core of ferromagnetic material, and a control winding disposed on said core and having induced therein a voltage and current of a first polarity to generate said charging supply in response to the passage of a first pole of the magnet and having induced therein a voltage and current of opposite polarity to said first polarity to generate said triggering signal in response to passage of the second pole of said magnet;

storage means connected to said generating means and being charged in response to said charging supply for storing said energy delivered from said charging supply;

ignition coil means disposed on said core for receiving energy and for generating an ignition voltage in response to said received energy; and

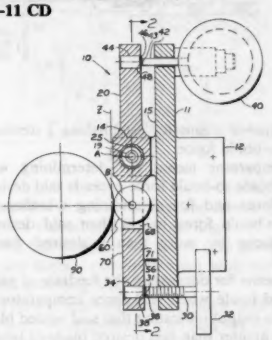
means responsive to said triggering signal for controlling the discharge of said storage means into said ignition coil means, said capacitor discharge ignition system providing a predetermined ignition timing characteristic to said generated ignition voltage, said predetermined ignition timing characteristic including a predetermined ignition retard of at least 10 degrees at engine speeds in excess of desired operating speeds with respect to the ignition timing at a reference speed in the normal operating speed range of the engine, said predetermined ignition retard corresponding to a predetermined inductance value of said control winding.

4,228,781

TRAMMING FIXTURE FOR POSITIONING A DRESSING WHEEL

Edward W. Haug, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Feb. 9, 1979, Ser. No. 10,766
Int. Cl.³ B24B 53/06
U.S. Cl. 125—11 CD **14 Claims**



1. A tramming fixture for use in accurately positioning a dressing wheel in a dressing wheel fixture of a grinding wheel dressing machine such that the center of the transverse radius of the circumferential apex of the dressing wheel at the point of dressing contact lies on a dressing axis about which the dressing wheel may be rotated by the dressing wheel fixture, said dressing axis being maintained a predetermined distance from the grinding wheel surface being dressed, said tramming fixture comprising: a fixed support base; a lever mounted on said base by rotation about an axis of said lever, said axis being fixed with respect to said base; means for selectively adjusting the position of said lever through rotational movement of the lever; means for indicating the rotational movement of said lever; and a contact surface means associated with said lever and displaced from said lever axis to contact said dressing wheel at a point on said apex when moved towards said dressing wheel through movement of said lever by said adjusting means, whereby said indicating means provides a reading indicative of relative dressing wheel position.

4,228,782

SYSTEM FOR REGULATING THE APPLIED BLADE-TO-BOULE FORCE DURING THE SLICING OF WAFERS

Robert R. Demers, Lawrenceville, and Marvin A. Leedom, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1978, Ser. No. 940,751
Int. Cl.³ B28D 1/04
U.S. Cl. 125—14 **16 Claims**

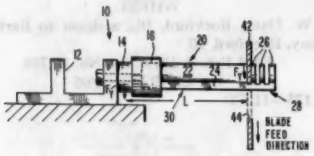
1. In a wafer saw for slicing thin wafers from a boule of

source material in which said saw has a saw blade which revolves at high speed for slicing wafers from said boule; said saw holds said boule stationary during the slicing of each wafer; said saw translates said revolving saw blade to cause the cutting surface of said blade to penetrate said stationary boule to slice a wafer from said boule by removing boule material which attaches said wafer to the remainder of said boule and said boule and said saw has a control system for controlling the rate of translation of said blade, the improvement comprising:

means for regulating the blade-to-boule force urging said blade of said saw into said boule during the slicing of wafers to improve the as-sawn quality of the wafers, said means for regulating comprising:

force sensing means for sensing the blade-to-boule force urging said blade of said saw into said boule;

said force sensing means comprising a transducer fixed to said stationary boule for sensing said blade-to-boule force;



force reference means for establishing a desired pattern of blade-to-boule force;

force comparator means for determining whether said sensed blade-to-boule force exceeds said desired blade-to-boule force and for determining whether such sensed blade-to-boule force is less than said desired blade-to-boule force by more than a desired force-hysteresis amount;

control means for decreasing the feedrate of said saw blade into said boule when said force comparator means produces an output indicating that said sensed blade-to-boule force is greater than said desired blade-to-boule force and for increasing said feedrate when said comparator means produces an output indicating that said sensed blade-to-boule force is less than said desired blade-to-boule force by an amount which is greater than said desired force hysteresis amount.

4,228,783

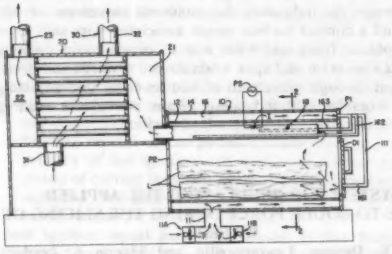
COMBUSTION HEATER

Paul A. Kalenian, 73 Otis St., Northboro, Mass. 01532

Filed Oct. 21, 1977, Ser. No. 844,272

Int. Cl.[2] F24H *3/06*

U.S. Cl. 126—112 **4 Claims**



1. Combustion heater comprising

first means defining a combustion chamber with inner and outer walls and an annulus therebetween and with a lower space within the inner wall having a forward end and rear end for holding an elongated solid fuel charge and means for feeding primary air thereto and combustion gas products therefrom both at said forward end so that the charge burns from said forward towards said rear end of said chamber,

second means defining an elongated combustion gas products conduit running above and substantially parallel to the fuel charge space and within the flame produced thereby and having an entrance for combustion gas products of said first means,

said first and second means being arranged to define an S-draft gas flow path,

means defining a principal heat exchanger for receiving the exhaust of said conduit and extracting heat therefrom, and

means for injecting secondary air into the combustion chamber outside of and adjacent to the exhaust conduit at multiple points along the length thereof to enhance flame coverage thereof,

means for producing after-burning in said conduit by injecting secondary air therein at a point downstream of the conduit entrance, and

means for preheating the primary air and secondary air and after-burner air in counter-current heat exchange in said combustion chamber annulus by injection to said annulus at the combustion chamber rear end and movement to said forward end.

4,228,784

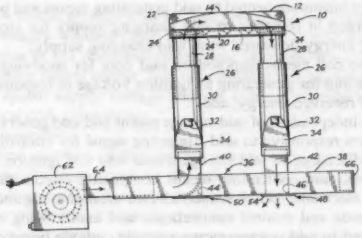
FIREPLACE FORCED AIR HEATING APPARATUS

Dannie O. Mølafouris, P.O. Box 13637, Portland, Oreg. 97303

Filed Sep. 22, 1978, Ser. No. 945,135

Int. Cl.[3] F24B *7/00*

U.S. Cl. 126—121 **5 Claims**



1. Fireplace forced air heating apparatus, comprising:

(a) an upstanding, vertically and laterally elongated heat exchanger contoured and dimensioned for placement adjacent the rear wall of a fireplace and enclosing a plenum,

(b) a pair of tubes connected to the heat exchanger adjacent the bottom and lateral sides thereof and communicating at their inner ends with the plenum, the tubes extending horizontally forward from the heat exchanger toward the front of the fireplace,

(c) an elongated main duct disposed horizontally across and forwardly of the pair of tubes and extending laterally beyond said tubes, the ends of the main duct being open,

(d) a pair of duct segments secured at their forward ends to the rear side and intermediate the ends of the main duct for communication therewith and extending rearwardly for communication of their rearward ends with the forward ends of the pair of tubes,

(e) a pair of ports in the front side of the main duct substantially opposite the pair of duct segments,

(f) a baffle member comprising a hollow plug receivable interchangeably in either of the pair of ports for communicating the associated duct segment with the adjacent open end of the main duct, whereby to deliver cool air from said open end to the heat exchanger for heating, the baffle

member substantially closing the associated port and the main duct inwardly of said baffle member,

(g) a fan assembly having an air inlet and an air outlet, the outlet being connectable interchangeably to either open end of the main duct for coupling said air outlet to the open end of the main duct adjacent the baffle member, for delivering cool air to the heat exchanger, and

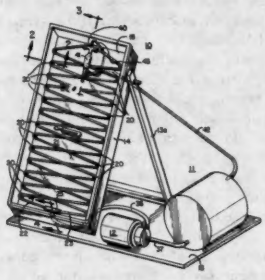
(h) a hot air outlet member comprising a hollow plug receivable interchangeably in either of the pair of ports for communicating the associated duct segment with the atmosphere through said plug and port, whereby to discharge hot air from the heat exchanger through the outlet member into the atmosphere.

4,228,785

SOLAR HEATING SYSTEM

George L. Wagenseller, 33 Inwood Rd., Levittown, Pa. 19057

Filed Jan. 29, 1979, Ser. No. 7,251
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—422 5 Claims



1. A solar heating system which comprises

a solar panel open at one side,

a transparent cover closing said open side,

a pipe system in said panel for liquid circulation therethrough and having inlet and discharge ends,

a temperature responsive control valve in said panel connected to said pipes and controlling liquid delivery from said pipe system at a predetermined temperature level,

a storage tank for receiving liquid from said valve,

a circulating pump interposed between said tank and said pipes for return of liquid thereto,

a check valve between said pump and said pipes,

a pipe connecting said check valve to said pump, and

temperature responsive control means responsive to the temperature in said panel for controlling the operation of said pump.

4,228,786

FLOW DIRECTOR

Fred I. Frankenfield, Noblesville, Ind., assignor to Hedback Corp., Indianapolis, Ind.

Filed Feb. 5, 1979, Ser. No. 9,411
Int. Cl.[3] F24D 5/04
U.S. Cl. 126—427 2 Claims

1. The combination comprising:

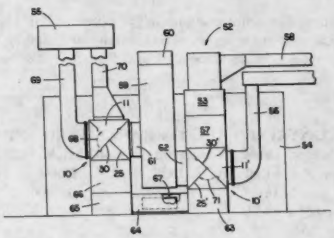
a furnace including a blower for moving air therethrough from an inlet to an outlet;

a diverting box having at least first and second opposed sides, said diverting box including wall portions defining first, second, third and fourth openings arranged consecutively between the first and second sides;

a first baffle mounted within said diverting box and extending inwardly from a wall portion between the first and second openings, said first baffle spanning between the first and second opposed sides of said diverting box;

second, third and fourth baffles mounted within said diverting box and extending inwardly from wall portions between the second and third, third and fourth, and fourth and first openings, respectively, each of said baffles spanning between the first and second opposed sides of said diverting box;

a damper rotatably mounted within said diverting box, said damper being rotatable about an axis extending normal to the first and second opposed sides, said first baffle extending inwardly to said damper, said damper having first and second portions extending in differing directions from said axis, said damper having a first position in which the first and second portions are adjacent said second and fourth baffles respectively, thereby permitting flow between the third and fourth openings and blocking flow between the first and second openings, said damper further having a second position in which one of the first and second portions of said damper is adjacent said third baffle, thereby



permitting flow between the first and fourth openings and between the second and third openings;

said diverting box being connected to said furnace with the inlet of said furnace communicating with the third opening of said diverting box;

a supply air duct connected to said furnace with the outlet of said furnace communicating with said supply air duct;

a return air duct connected to said diverting box with said return air duct communicating with the fourth opening of said diverting box;

means for treating air, said air treating means including an inlet and an outlet;

first connecting means for connecting the first opening of said diverting box with the inlet of said air treating means; and

second connecting means for connecting the second opening of said diverting box with the outlet of said air treating means.

4,228,787

SOLAR HEATER, BUILDING CLADDING UNIT

Hans Steinemann, Grossbuch, Switzerland, assignor to Micafil, AG, Zurich, Switzerland

Filed Sep. 9, 1977, Ser. No. 832,024
Claims priority, application Switzerland, Sep. 10, 1976, 11504/76
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—433 13 Claims

1. A solar heated, thermally protective building cladding comprising:

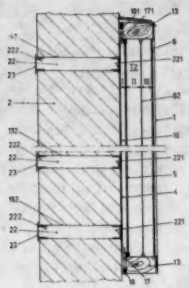
a building having an outer wall;

a portion of an outer surface of the wall being covered by a selective absorbing layer;

a plurality of heat pipes disposed in the wall in thermal communication with the selective absorbing layer, the pipes extending between the layer and the interior of the building;

a frame carrying two spaced-apart transparent sheets having in the space therebetween one or more movable members

arranged for movement to selectively permit or prevent solar radiation from passing between said sheets; and



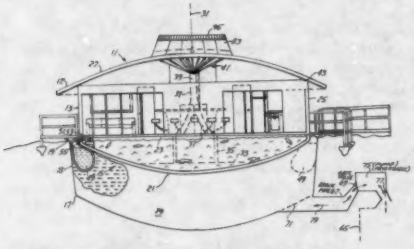
the frame being mounted upon the outer wall of the building enclosing the layer so as to form an air space between the layer and the innermost of said transparent sheets.

4,228,788

SELF-CONTAINED ALL-TERRAIN LIVING APPARATUS

John Moeser, 14460 Promanade, Detroit, Mich. 48213

Filed Jan. 8, 1979, Ser. No. 1,689
Int. Cl.³ F24V *3/02*; B63B *39/03*
U.S. Cl. 126—437 **25 Claims**



1. A self-contained all terrain living apparatus comprising a first reservoir within the ground surface having side walls of circular form, of a predetermined diameter and having a quantity of water therein;

a building having a roof and a peripheral side wall of circular form of less diameter than said reservoir wall, concentrically nested and spaced within said reservoir;

a convex hull peripherally nested and sealed to the bottom of said building wall, and immersed within the water and floatingly projected into said reservoir; with a substantial portion of said building wall extending above said ground surface;

flexible and yieldable spacer means upon and within the upper portion of said first reservoir spacing and enaging and yieldably adapted to guide the building side walls;

a second reservoir within said ground surface spaced from and below said first reservoir;

a drain outlet spaced above the bottom of said first reservoir;

a valve on and controlling said outlet;

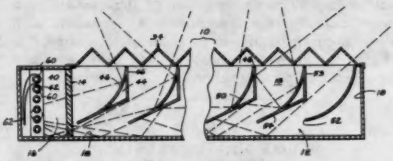
and a conduit interconnecting said outlet and said second reservoir, whereby controlled opening of said valve drains controlled quantities of water from said first to second reservoir, said building controllably descending within said first reservoir throughout any desired distance up to said roof yet buoyantly immersed within the remaining water in said first reservoir, for protectively enclosing the building within said first reservoir against storms, tornados, earthquakes, extreme temperature, or other conditions endangering the integrity of said building.

4,228,789

SOLAR ENERGY COLLECTOR

James C. Kay, R.F.D. #6, Rome, Ga. 30161

Filed Sep. 19, 1978, Ser. No. 943,817
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **6 Claims**



1. A solar energy collector, comprising:

floor and upstanding perimetrical wall means providing a primary housing, including one transparent sidewall portion;

a transparent panel covering said primary housing;

a longitudinally extending, series of transversally extending, curved light-reflecting baffles mounted within said primary housing for focusing towards said one transparent sidewall portion the sunlight which enters the primary housing through said transparent panel when sunlight is incident upon said solar energy collector;

the curved light-reflecting baffles each comprising a generally cylindrically curved arcuate body of approximately 60° in arcuate extent and each being oriented in the primary housing so as to have a concave upper surface with an upper edge that is nearly vertical and a lower edge that is forwardly and downwardly slanted but nearly horizontal, the upper edge of each baffle being generally in vertical alignment with the lower edge of its respectively upstream neighbor;

roof, floor and upstanding perimetrical wall means providing a secondary housing located downstream of said series of baffles, said secondary housing including said transparent sidewall portion, the remainder of these wall means being of thermally insulating material; and

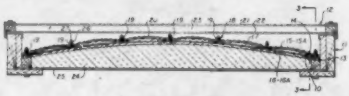
collector plate means housed within the secondary housing and including means for leading collected energy from the solar energy collector secondary housing.

4,228,790

SOLAR HEATER

Richard R. Davison, 303 Crescent; William B. Harris, Rte. 3, Box 293 A, both of Bryan, Tex. 77801, and Salomon Maldonado, 2314 Louis Pl., Harlingen, Tex. 78550

Filed Jan. 10, 1977, Ser. No. 757,956
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—444 **10 Claims**



1. A solar heater for collecting solar radiation in a fluid comprising:

(a) a base

(b) a 1st flexible fluid retaining means connected adjacent said base for collecting solar radiation

(c) a 2nd flexible fluid retaining means for retaining fluid

(d) Fixed spacer means connected to said base through said 1st and 2nd flexible fluid retaining means at spaced intervals for forming a seal and for limiting the expansion of said 1st and 2nd flexible fluid retaining means connected adjacent said base for collecting solar radiation

(e) a first flow way means connected in fluid communication

with said 1st and 2nd flexilbe fluid retaining means for flowing fluid therein; and

(f) a second flow way means connected in fluid communication with said 1st and 2nd flexible fluid retaining means for flowing fluid therefrom.

4,228,791

SOLAR ENERGY COLLECTING ROOF

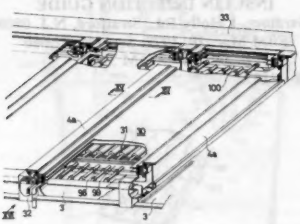
Takashi Hirai, and Tadahiro Hino, both of Tokyo, Japan, assignors to Showa Aluminium K.K., Osaka and Kabushiki Kaisha Hirai Giken, Tokyo, both of, Japan

Filed Jul. 3, 1978, Ser. No. 921,238

Claims priority, application Japan, Jul. 6, 1977, 52-80596; Nov. 24, 1977, 52-139904

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **9 Claims**



1. A solar energy collecting roof comprising metal roof units capable of heat insulating, extrusion-molded joint members for joining said metal roof units, cover glass frames fitted between each adjacent pair of said joint members, and heat collecting piping provided in box-shaped spaces defined by the metal roof units, the joint members and the cover glass frames, said solar energy collecting roof being characterized in that each of said cover glass frames comprises an upper rail which has an upper surface provided with a drip projection and also has an outwardly extending lowermost portion comprising a flange formed with an upward drip projection; a lower rail which has an upper portion comprising a flange formed with a downward projection; a pair of longitudinal rails each of which has an upper portion including a drip projection and also has a lower portion including both a downwardly extending leg and an outside leg; and glass framed by said upper, lower and longitudinal rails.

4,228,792

EXSANGUINATING DEVICE FOR DISPLACING BLOOD FROM A LIMB BY COMPRESSION

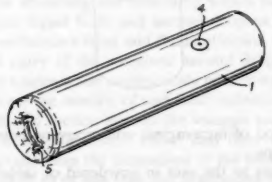
Noel C. Rhys-Davies, Yeovil District Hospital, Higher Kingston, Yeovil, Somerset, England

Filed Sep. 20, 1978, Ser. No. 943,774

Claims priority, application United Kingdom, Sep. 23, 1977, 39781/77

Int. Cl.³ A61H *9/00, 15/00*

U.S. Cl. 128—24.3 **6 Claims**



1. A device for exsanguinating a limb comprising a double-walled elongated cylindrical tubular body of elastomeric material of which the inner and outer walls have substantially the same unstressed dimensions and are interconnected solely at their ends to form a continuous envelope which is filled with a fluid under pressure so that the fluid pressure distends the outer wall and partially collapses and expands the inner wall inwardly to substantially fill the inner space, wherein the outer surface of the envelope is free of protrusions such that as a limb is inserted in either end of the tubular body the inner and outer walls constantly exchange positions and the inner wall will progressively compress the limb by virtue of the pressure of the contained fluid.

4,228,793

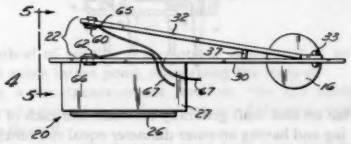
PRESSURE-SWITCH OPERATED VIBRATING UNIT

Carol a.k.a. Carali Ramey, 1613-1/2 Ocean Front Walk, Playa del Rey, Calif. 90291

Continuation-in-part of Ser. No. 737,797, Nov. 6, 1976, Pat. No. 4,136,685. This application Dec. 22, 1978, Ser. No. 972,284

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—33 **13 Claims**



1. A vibratory unit which comprises:

a vibratory motor means;

a portable power source;

a support member for supporting said motor means and power source;

a first electrically conductive member affixed to said support member;

a pressure plate means having a second electrically conductive member affixed thereto, said pressure plate means being enlarged with respect to both said first and second conductive members;

means for electrically interconnecting said power source and vibratory means to said first and second conductive members for energization of said vibratory motor means upon electrical interconnection of said first and second conductive members; and

spacer means for maintaining said conductive element of said pressure plate means in normally spaced, overlying alignment with respect to said first conductive member whereby upon application of inwardly directed force onto said pressure plate means, said first and second conductive members are electrically interconnected to energize said vibratory motor means and upon release of said inwardly directed force said vibratory motor means is de-energized.

4,228,794

MASSAGER WITH DUMBBELL-SHAPED HOUSING

Hans Boller, Steineggerstrasse, CH 8503 Hüttwilen, Switzerland

Filed Sep. 28, 1978, Ser. No. 946,601

Claims priority, application Switzerland, Oct. 3, 1977, 12085/77

Int. Cl.² A61H *7/00*

U.S. Cl. 128—49 **9 Claims**

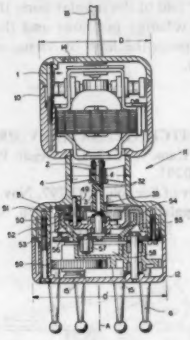
1. A massager comprising:

a housing elongated along a housing axis and having an upper end, a lower end, and an intermediate portion between and of smaller dimension than said ends transverse to said housing axis, said upper and lower ends being of outer diameters at least one-half greater than the outer diameter of said intermediate portion;

a shaft in said housing extending generally axially between said ends thereof;

a plurality of fingers projecting generally axially from said lower end and vibratory in a direction generally perpendicular to said housing axis;

a transmission in said lower end between said shaft and said fingers;



a fan on said shaft generally between said ends of said housing and having an outer diameter equal substantially to the inner diameter of said intermediate portion; and

drive means including an electric motor in said upper end for rotating said shaft and thereby vibrating said fingers and operating said shaft to force air axially through said housing.

4,228,795

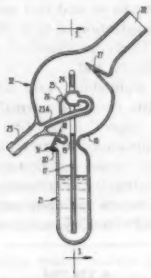
APPARATUS FOR PRODUCING FINELY DIVIDED LIQUID SPRAY

Robert S. Babington, 1113 Ingleside Ave., McLean, Va. 22101

Filed Mar. 8, 1977, Ser. No. 775,494

Int. Cl.[2] **B05B** *11/04, 11/06*

U.S. Cl. 128—200.22 **54 Claims**



1. Apparatus for producing a finely divided liquid spray comprising:

a first chamber for holding a supply of liquid;

a second chamber;

first means for conveying liquid from the first chamber to the second chamber;

second means distinct from the first means for conveying the liquid from the second chamber back to the first chamber;

means for producing alternately and repetitively a first pressure differential and either a second different opposite pressure differential or pressure balance between said first and second chambers, said first pressure differential causing the flow of liquid from said first chamber to said second chamber and said second pressure differential or pressure balance causing the flow of said liquid from said second chamber back to said first chamber;

a hollow plenum chamber having a smooth outer surface over at least a portion thereof and so disposed in the flow path of said liquid as it moves from said first chamber to said second chamber and back to said first chamber as to have at least a portion of the liquid impinge upon its outer surface;

said plenum chamber defining therein at least one through aperture;

means for supplying gas under pressure to the interior of the plenum chamber to exit through said aperture; and

outlet means for exiting of the finely divided liquid particles from the apparatus.

4,228,796

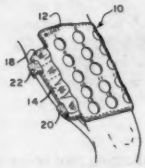
INSULIN INJECTION GUIDE

Marie A. Gardiner, 1 Holly Rd., Stratford, N.J. 08084

Filed Mar. 19, 1979, Ser. No. 22,086

Int. Cl.[3] **A61M** *5/00*

U.S. Cl. 128—215 **9 Claims**



1. An injection guide comprising:

a substantially flexible sheet-like material of predetermined shape, said material having a plurality of holes passing therethrough;

means attached to said material for securing the same to a person's thigh; and

means associated with each of said holes for identifying each hole and for distinguishing each hole from each of the other holes, said means associated with each of said holes being indicia means identifying the days of the week.

4,228,797

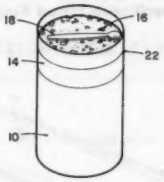
INTRAVAGINAL CONTRACEPTION METHOD

Richard P. Dickey, 5640 Read Blvd., Ste. 640, New Orleans, La. 70127

Filed Sep. 25, 1978, Ser. No. 945,529

Int. Cl.[3] **A61F** *13/20*

U.S. Cl. 128—270 **6 Claims**



1. A method of intravaginal contraception comprising the following steps:

(a) providing to the user in powdered or tablet, packaged form a spermicidal chemical to be kept by the user in its packaged form until needed;

(b) removing the spermicidal from its packaging just prior to use and dissolving it in water;

(c) just prior to use impregnating a suitable shaped matrix of

either organic or inorganic material with the resolvent solution;

(d) placing the solution impregnated matrix into the vagina prior to coitus; and

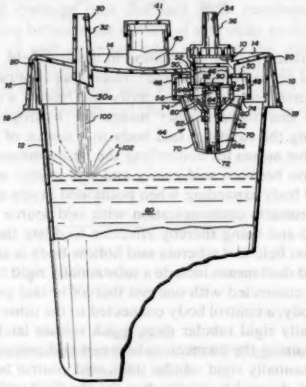
(e) removing the matrix following coitus.

4,228,798

SUCTION RECEPTACLE WITH HYGROSCOPIC FILTER

David W. Deaton, 1009 Russwood, Abilene, Tex. 79601

Filed May 1, 1979, Ser. No. 34,992
Int. Cl.[3] A61M *1/00*
U.S. Cl. 128—276 19 Claims



1. A medical suction system for connection to a conventional hospital vacuum source having a vacuum pressure sufficient to create a suitable flow rate for draining fluid from a patient area comprising:

a fluid collection receptacle including a suction port for being connected to the vacuum source and also including a fluid receiving port, said vacuum source creating a vacuum within said receptacle sufficient to withdraw fluid from the patient area at a desired flow rate for collection within said fluid collection receptacle;

a shutoff valve mounted in association with said fluid collection receptacle and responsive to a predetermined height of fluid within said fluid collection receptacle for closing said suction port to prevent application of vacuum pressure from the vacuum source through said suction port to said fluid collection receptacle; and

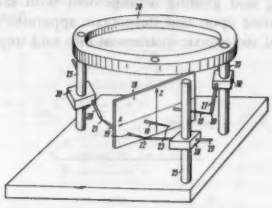
hygroscopic filter means for filtering aerosol droplets formed from bacteria encapsulated by liquid, said filter means mounted between said shutoff valve of said fluid collection receptacle and the vacuum source and having fibers for absorbing and collecting within the interior of said fibers liquid from said aerosol droplets entrained in the air withdrawn from said fluid collection receptacle to prevent entry of the entrained aerosol droplets into the vacuum source while continuously permitting the passage of air from the interior of said fluid collection receptacle through said suction port to the vacuum source prior to actuation of said shutoff valve, said filter having pores sized greater than the dimensions of the bacteria but generally equal to or less than the dimensions of the aerosol droplets encapsulating the bacteria in order to filter bacteria having dimensions less than about 5 microns from the air stream while allowing continuous passage of the air stream through said filter means.

4,228,799

METHOD OF GUIDING A STEREOTAXIC INSTRUMENT AT AN INTRACEREBRAL SPACE TARGET POINT

Andrei D. Anichkov, uli*sa Blokhina, 6/3, kv. 4; Jury Z. Polonsky, ulitsa Komsomola, 16, kv. 24, and Vladimir V. Usov, Degtyarny pereulok, 26, kv. 3, all of Leningrad, U.S.S.R.

Filed Sep. 22, 1978, Ser. No. 945,209
Claims priority, application U.S.S.R., Sep. 28, 1977, 2528446
Int. Cl.[3] A61B *6/02*
U.S. Cl. 128—303 B 6 Claims



1. A method of guiding a stereotaxic instrument at an intracerebral space target point, comprising the steps of:

injecting a roentgenocontrast medium into the cerebral cavity of a patient to produce contrast of the intracerebral points thereof;

securing to the patient's cranium at least four detachable roentgenocontrast markers having known distances therebetween, with one of said detachable roentgenocontrast markers being offset from a straight line joining any two of other said detachable roentgenocontrast markers;

effecting a first roentgenography of the patient's head;

effecting a second roentgenography of the patient's head with said second roentgenography being effected under projection conditions differing from projection conditions of said first roentgenography;

removing said detachable roentgenocontrast markers from the patient's head;

identifying a position of said detachable roentgenocontrast markers relative to said intracerebral points as references by using the roentgenograms available from said first and second roentgenographies, the distances between said detachable roentgenocontrast markers and the positions of the roentgen radiation source relative to the roentgen films in the course of said first and second roentgenographies;

identifying a position of the intracerebral space target point relative to said intracerebral reference points;

constructing an intracerebral space physical model presenting the relative position of said intracerebral reference points, said detachable roentgenocontrast markers and said target point, said intracerebral space physical model including at least three points, each of which is adapted to simulate one of said detachable roentgenocontrast markers, and a point adapted to simulate said target point;

placing a sterotaxic apparatus on the patient's head;

recurrently securing to the patient's cranium said detachable roentgenocontrast markers in exactly the same position as they had relative to the patient's cranium in the course of said first and second roentgenographies;

identifying the positions of said detachable roentgenocontrast markers, simulated in said intracerebral space physical model, relative to said stereotaxic apparatus and fixing in a stereotaxic apparatus model these indicated positions of said detachable roentgenocontrast markers relative to said stereotaxic apparatus;

orienting said intracerebral space physical model relative to said stereotaxic apparatus model by placing said three points of said intracerebral space physical model adapted to simulate said detachable roentgenocontrast markers in the specified positions of said detachable roentgenocon-

trast markers relative to said stereotaxic apparatus set forth in said stereotaxic apparatus model;

mounting a guiding arrangement with a stereotaxic instrument upon said stereotaxic apparatus model and adjusting an operative end of said stereotaxic instrument to the specified point of said intracerebral space physical model adapted to simulate the specified target point, with the position of said stereotaxic apparatus being rigidly secured at said guiding arrangement;

drilling a trepanation aperture; and

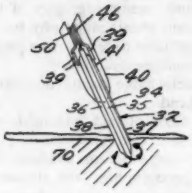
mounting said guiding arrangement with said stereotaxic instrument upon said stereotaxic apparatus and introducing said stereotaxic instrument into said trepanation aperture.

4,228,800

BIPOLAR ELECTROSURGICAL KNIFE

Howard E. Degler, Jr., St. Petersburg; David E. Clark, Gainesville; John J. Hren, Gainesville; David A. Jenkins, Gainesville, and Paul F. Johnson, III, Gainesville, all of Fla., assignors to Concept, Inc., Clearwater, Fla.

Continuation of Ser. No. 695,649, Jun. 14, 1976, abandoned.
This application Apr. 4, 1978, Ser. No. 893,422
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.14 **17 Claims**



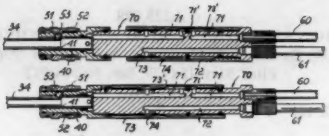
1. A bipolar electrosurgical instrument comprising an electrically insulated housing, constructed of a nonconductive material and having a substantially pencil shaped configuration, a blade assembly mounted in said housing and projecting from said housing, said blade assembly comprising a center electrode, insulation means on opposite sides of said electrode and side electrodes ranging in width from 0.047 inches to 0.100 inches secured to said insulation means so that they are symmetrically disposed with respect to said center electrode and separated from said center electrode by said insulation means, said blade assembly center electrode being formed with a substantially rectangular linear shape with linearly oriented beveled edges and connected to said insulation means, said insulation means comprising two insulator members of substantially rectangular linear shape positioned on each side of said center electrode with aligned beveled edges, said two insulator members being composed of at least 99% pure Al_2O_3, a source of energy, means for connecting said electrodes to said source of energy so that an output circuit of the source of energy comprising a high frequency electrical current is completed through tissue intervening between and in contact with said electrodes, said side electrodes being shorted together within said housing and acting as return electrodes during operation of this instrument and switch means connected to said source of energy for selectively energizing said electrodes.

4,228,801

DILATOR FOR APPLICATION IN MEDICAL FIELD

Dante Magnasco, Bergamo, and Livio Marinoni, Milan, both of Italy, assignors to Elektromedical Company S.r.l., Milan, Italy

Filed Nov. 21, 1978, Ser. No. 962,834
Claims priority, application Italy, Nov. 29, 1977, 30190 A/77
Int. Cl.³ A61M *29/02, 25/00*
U.S. Cl. 128—344 **4 Claims**



1. A dilator for the application in medical field, comprising an at least partially hollow body made of an elastically deformable material and defining a cavity and having a distal and a proximal end thereof, duct means for hydropneumatically connecting the cavity of said body to a source of pressurized fluid, valve means for controlling the hydropneumatical communication between said cavity and said source and the outside, said body expanding when positioned in situ and when in hydropneumatic communication with said source of pressurized fluid and being thereby effective to dilate the corporeal application field and wherein said hollow body is an elongated body, said duct means include a substantially rigid tubular duct sealingly connected with one end thereof to said proximal end of said body, a control body connected to the other end of said substantially rigid tubular duct, quick release latching means for maintaining the connection between said control body and said substantially rigid tubular duct, said control body having connected therewith an inlet duct for the fluid under pressure and an outlet duct therefor and a slide distributor controlling the flow of pressurized liquid therethrough.

4,228,802

SELF-INFLATING AND SELF-CLEANING CATHETER ASSEMBLY

William A. Trott, Winnipeg, Canada, assignor to Medical Products Institute Incorporated, Winnipeg, Canada

Filed Jun. 7, 1978, Ser. No. 913,516
Claims priority, application United Kingdom, Jun. 15, 1977, 24960/77
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—349 R **18 Claims**

1. A catheter assembly for use as a urinary drainage device through the urethra; comprising in combination a flexible, longitudinally extending outer envelope, an inner drainage

tube slidably engaging within said envelope, and means to detachably retain said catheter in position within the urethra, said means including an expanding portion formed along the length of said outer envelope adjacent the distal end thereof and extending uninterruptedly around the periphery thereof, mechanical means adjacent the proximal end of said outer envelope operatively connected to said expanding portion, to expand and retract said expanding portion, said expanding portion including means to facilitate the expansion of said expanding portion, said last mentioned means including a plurality of transversely notched splines formed on the inner wall of said expanding portion, means to detachably retain said inner drainage tube in position within said outer envelope, means to position said inner drainage tube within said outer envelope to define an annular longitudinally extending lumen between said drainage tube and said outer envelope, means communicating between the outside of said outer envelope and the interior of said drainage tube adjacent the distal ends thereof to convey fluids from outside of said outer envelope to the interior of said drainage tube and further means communicating between said lumen and the exterior of said outer envelope.

4,228,803

PHYSIOLOGICALLY ADAPTIVE CARDIAC PACEMAKER

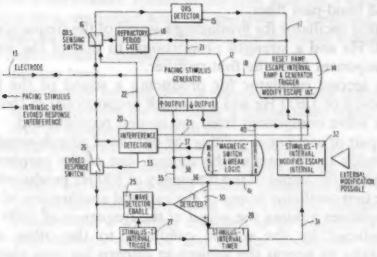
Anthony F. Rickards, London, England, assignor to Credit du Nord International N.V., Willemstad, Netherlands Antilles

Filed Oct. 6, 1978, Ser. No. 949,044

Claims priority, application United Kingdom, Jun. 23, 1978, 27693/78

Int. Cl.³ A61N *1/30*

U.S. Cl. 128—419 PG **37 Claims**



1. A demand cardiac pacemaker having circuitry for carrying out demand pacer functions, adapted to be utilized in combination with an electrode for delivering stimulus signals to a patient's heart and for receiving from said patient's heart signals representative of heart activity, comprising:

a. stimulus signal generator means for delivering stimulus signals, having modifiable means for setting its escape interval;

b. T wave means for sensing a T wave of an evoked heart response following a delivered stimulus signal, and for determining the time relationship of said T wave relative to said delivered stimulus signal; and

c. modifying means connected to said T wave means and said modifiable means for modifying said escape interval as a function of said time relationship.

4,228,804

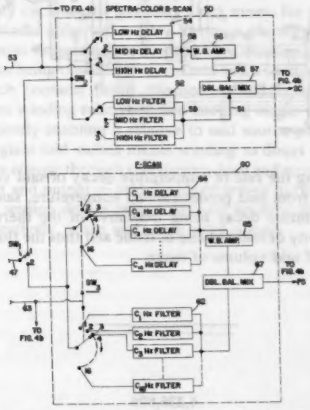
DIAGNOSTIC ULTRASONOGRAPHY UTILIZING FREQUENCY SPECTRUM ANALYSIS PRESENTED IN TERMS OF B-SCAN COLOR PATTERNS OR X-Y GRAPH DISPLAYS

Edward Holasek, and Wayne D. Jennings, both of Cleveland, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Continuation-in-part of Ser. No. 690,605, May 27, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 882,149

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **16 Claims**



1. A method for characterizing a soft tissue specimen as a function of its effect on the frequency spectrum of an applied signal comprising the steps of:

applying a first ultrasonic frequency band complex wave signal to a soft tissue specimen, said applied signal having a first bandwidth and center frequency;

detecting at least a portion of said applied signal as affected by said specimen;

filtering said detected signal portion to provide a plurality of frequency spectrum signals indicative of the frequency content of said detected signal portion, said spectrum signals representing a respective plurality of frequency bands extending over at least a portion of said first frequency band, said frequency bands having bandwidths substantially less than said first bandwidth;

processing said spectrum signals to represent the approximate instantaneous power spectrum of said detected portion; and

simultaneously displaying said processed spectrum signals in a visual format for comparison of the frequency and energy magnitude of said spectrum signals relative to each other, said visual format being spatially related to the structure of said specimen as a function of the time between said applying and said detecting.

4,228,805

METHOD OF MEASURING BLOOD PERFUSION

Arye Rosen, Cherry Hill, and William P. Santamore, Medford, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,605

Int. Cl.³ A61B *5/02*

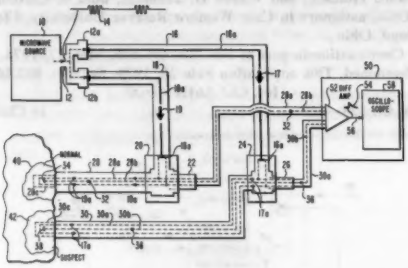
U.S. Cl. 128—691 **4 Claims**

1. A method of determining the fluid perfusion of tissue comprising the steps of:

irradiating said tissue with microwave frequency signals to elevate a given volume of said tissue uniformly to a predetermined temperature, said signals having a predetermined

rate, amplitude and frequency to uniformly heat said given volume;

interrupting said irradiating signals; and



measuring the rate of temperature decay of said volume of tissue from said predetermined temperature, said rate of temperature decay being indicative of the thermal conductivity of said volume of tissue and thus the fluid perfusion of said volume of tissue.

4,228,806

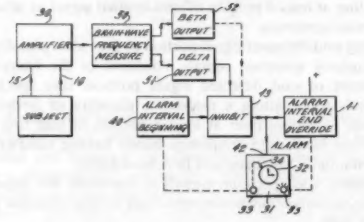
SLEEP STATE INHIBITED WAKE-UP ALARM

Derek Lidow, Beverly Hills, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed May 25, 1978, Ser. No. 909,580

Int. Cl.[3] A61B 5/04

U.S. Cl. 128—731 **15 Claims**



1. A wake-up alarm comprising, in combination: sensor means associated with a subject and monitoring at least one characteristic of said subject related to the depth of sleep of said subject and delivering an output related to the depth of sleep of said subject; wake-up alarm means; adjustment means connected to said wake-up alarm means to enable said alarm means to sound an alarm at any time within a given time range; inhibit means connected to said wake-up alarm means for inhibiting the operation of said alarm within said given time range when said inhibit means is in a given energization state; signal-processing means connected to said sensor means and producing a first output signal when said sensor's output indicates that said subject is in a deep-sleep or REM state, and producing a second output signal when said sensor output indicates that said subject is in a sleep state shallower than said deep-sleep state; said output signals of said signal-processing means being connected to said inhibit means and causing said inhibit means to inhibit said alarm means when said subject is in said deep-sleep or REM state.

4,228,807

BIOFEEDBACK DEVICE FOR RECOGNITION OF α WAVE COMPONENT AND MUSCLE POTENTIAL COMPONENT

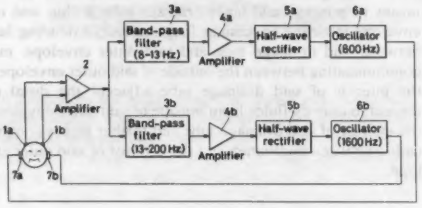
Akihiro Yagi, Tokyo; Yasuo Kuchinomachi, Yokohama, and Hiroyuki Kodama, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 781,362, Mar. 25, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,263

Claims priority, application Japan, May 27, 1976, 51-61528

Int. Cl.[3] A61B 5/04

U.S. Cl. 128—732 **1 Claim**



1. A biofeedback device comprising

(a) a pair of electrodes on the head skin of a subject for detecting a brain wave potential of a frequency of 8 to 13 Hz including an alpha-wave potential and a brain wave potential of a frequency of more than 13 Hz including a muscle potential,

(b) a first band-pass filter for extracting from the detected potentials a wave component of the frequency of 8 to 13 Hz,

(c) a second band-pass filter for extracting from the detected potentials a wave component of the frequency of more than 13 Hz,

(d) a first half-wave rectifier for cutting off the negative component of the wave component extracted by the first band-pass filter,

(e) a second half-wave rectifier for cutting off the negative component of the wave component extracted by the second band-pass filter,

(f) a first oscillator for producing a sound of the frequency of 800 Hz and a strength proportional to that of the wave component from the first rectifier,

(g) a second oscillator for producing a sound of the frequency of 1,600 Hz and a strength proportional to that of the wave component from the second rectifier, and

(h) a pair of earphones guiding the oscillated sounds simultaneously to the ears of the subject, one of the earphones guiding the sound of the frequency of 800 Hz produced by the first oscillator to one of the ears and another one of the earphones guiding the sound of the frequency of 1600 Hz produced by the second oscillator to the other ear, thereby to permit the subject to discern his own mental state from the strength of the sounds of the frequencies of 800 and 1600 Hz.

4,228,808

DEVICE FOR THE WITHDRAWAL OF BLOOD

Hermann J. Marsoner, Graz, Austria, assignor to AVL AG, Schaffhausen, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,887

Claims priority, application Switzerland, Sep. 8, 1977, 11029/77

Int. Cl.[3] A61B 5/14

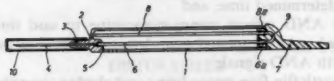
U.S. Cl. 128—762 **3 Claims**

1. A device for removing blood from blood vessels comprising a substantially sleeve-shaped jacket having a closed front end and at least partially formed from transparent material;

a puncture needle permanently mounted on said front end;

an opening in the interior of said front end communicating with said puncture needle; and

at least one capillary located in said sleeve-shaped jacket and removably inserted in the opening in said front end, the sleeve-shaped jacket at its rear end being closed by a closure element and the rear end of the capillary being



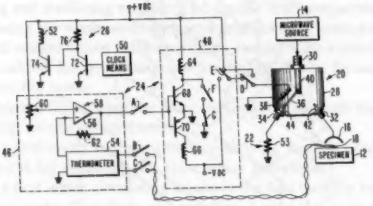
inserted in said closure element, the capillary fitting more tightly in the closure element at the rear of the jacket than in the opening in said front end so that upon detachment of the closure element from the sleeve-shaped jacket the capillary becomes separated from the puncture needle and remains stuck in the closure element.

4,228,809

TEMPERATURE CONTROLLER FOR A MICROWAVE HEATING SYSTEM

Robert W. Paglione, Robbinsville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 6, 1977, Ser. No. 840,036
Int. Cl.³ A61N 5/02
U.S. Cl. 128—804 **4 Claims**



1. In a microwave system of the type wherein a specimen is heated to a controlled temperature level by directing energy through an applicator and detecting the specimen temperature, the improvement comprising:

a dummy load;

a temperature sensing device responsive to the temperature of the specimen for providing a temperature signal indicative of specimen temperature;

switch means for directing the microwave energy through either said applicator or said dummy load, said switch means including an input coaxial connector and two output coaxial connectors along with a flexible magnetic reed contact and a winding disposed to be magnetically coupled thereto, each of said coaxial connectors having a center conductor, said reed contact being connected at one end to the center conductor of said input connector while having the other end thereof positionable to electrically connect with either center conductor of said output connectors in response to signals passing through said winding;

control means responsive to the temperature signal for actuating said switch means to direct the microwave energy through said applicator when the specimen temperature is below a set point and through said dummy load when the specimen temperature is at or above said set point, said control means being connected to receive the temperature signal from the temperature sensing device, said control means including threshold means for comparing the temperature signal from the temperature sensing device with said set point to produce an output having a first polarity when the specimen temperature is below said set point and a second polarity when the specimen temperature is above said set point and latching means for holding said switch means winding across sources of opposite polarity respectively in response to said first or second polarity of said threshold means output, said switch means directing the microwave energy through either the applicator or said dummy load respectively in response to each source of polarity; and

duty cycle means for synchronizing said switch means and said control means to apply the temperature signal to the threshold means only when the microwave energy is directed through said dummy load;

said duty cycle means including clock means for generating a periodic pulse and a relay having a plurality of switch contacts magnetically activated by a winding, said clock means being connected across said relay winding and said switch contacts being disposed to disable said switch means winding relative to said latching means while independently enabling it relative to said source polarity that energizes said switch means winding to direct the microwave energy through said dummy load and to connect the input and output of said threshold means to the temperature sensing device output and said latching means input respectively, when said clock pulse occurs.

4,228,810

CARE AND TREATMENT OF CURLY HUMAN HAIR

Edward R. Moore, Princeton, and Eldred O. Riddle, Brooklyn Park, both of Minn., assignors to La Maur Inc., Minneapolis, Minn.

Filed Nov. 20, 1978, Ser. No. 961,917
Int. Cl.³ A45D 7/00
U.S. Cl. 132—7 **3 Claims**

1. A method of permanently relaxing natural curls from hair on a human head, comprising:

(a) applying to said hair, including the root scalp portions of the hair, a curl relaxing composition comprising a blend of water and a salt of an acid having a pH less than 7, but more than 5, and having the capacity of reducing the disulfide linkages of the hair keratin, while manipulating the treated hair by hand action and combing into a relatively straightened condition;

(b) submitting said treated hair to a heat treatment at a temperature above human body temperature while simultaneously maintaining the moisture content of the treated hair substantially constant until said hair exhibits a relaxed condition;

(c) water rinsing said relaxing composition from the hair and scalp and subsequently removing said water to at least a towel blotted state;

(d) applying to the relaxed hair a fixative composition, comprising a blend of water and a weak alkaline substance, having a pH not greater than about 9, and having the capacity of chemically neutralizing the relaxing composition;

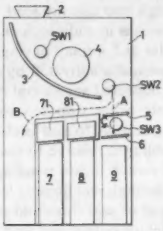
(e) water rinsing the fixative composition from the hair and subsequently removing said water to at least a towel blotted state; and

(f) stabilizing the condition of the treated hair by applying thereto a bonding composition comprising a water solution of a cationic thermosetting aminopolyamide-epichlorohydrin resin.

4,228,811
APPARATUS FOR CONTROLLING A COIN SORTING MACHINE

Akio Tanaka; Yoshihisa Nakajima, and Shinji Yokomori, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1978, Ser. No. 913,275
Claims priority, application Japan, Jun. 7, 1977, 52-66972
Int. Cl.[2] G07F *3/00*
U.S. Cl. 133—3 R **2 Claims**



1. A coin sorting machine of the type having a sorting means in a coin passageway for discriminating between true and false inserted coins and for providing corresponding true and false coin sorting signals, and a controllable segregating member for segregating a coin in a true coin direction or a false coin direction in response to said true and false sorting signals, respectively, the improvement comprising:

first coin detector means upstream of said segregating member for providing a first coin detection signal indicating the passage of a coin;

second coin detector means upstream of said segregating member and downstream of said first detector for providing a second coin detection signal indicative of the passage of a coin; and

logic circuit means for receiving said first and second detection signals and controlling said segregating member to segregate coins in a false coin direction when two first detection signals are received in succession without an intervening second coin detection signal;

said logic circuit means comprising:

first flip-flop means switched to a set condition by said first coin detection signal to provide a first set signal, and switched to a reset condition by said second coin detection signal to provide a first reset signal;

first AND circuit means responsive to the simultaneous appearance of said first set signal and a following first coin detection signal to produce a first AND signal;

second flip-flop means switched to a set condition by said first AND signal to produce a second set signal, and switched to a reset condition by said second coin detection signal to produce a second reset signal;

third flip-flop means switched to a set condition by a true coin sorting signal to produce a third set signal, and switched to a reset condition by said first reset signal to produce a third reset signal;

second AND circuit means responsive to the simultaneous occurrence of said second reset signal, said third set signal and said second coin detection signal to produce a second AND signal;

fourth flip-flop means switched to a set condition by said second AND signal to produce a control signal indicative of the detection of an inserted true coin spaced at least a predetermined minimum time from a following inserted coin, said segregating member being controlled by said control signal to segregate the true coin in said true coin direction;

third AND circuit means responsive to the simultaneous occurrence of said second set signal and said second coin detecting signal to produce a third AND signal;

said fourth flip-flop means being switched to a reset condition by said third AND signal thereby to inhibit the production of said control signal so that said true coin is segregated in said false coin direction when the time between two successively inserted coins is less than said predetermined time; and

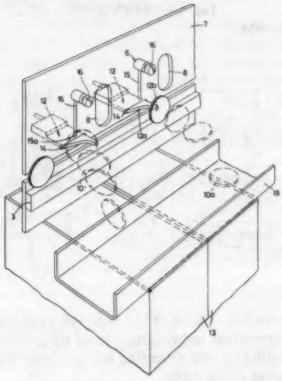
fourth AND circuit means responsive to said third reset signal and said second coin detection signal to provide a fourth AND signal;

said fourth flip-flop means being switched to the reset condition by said fourth AND signal thereby also to inhibit the production of said control signal so that said segregating member segregates a false coin in said false coin direction.

4,228,812
COIN SORTER WITH STRIKER MEANS TO PROPEL NON-STANDARD SIZE COINS

Karl Marti, Zofingen, Switzerland, assignor to PREMA GmbH, Zofingen, Switzerland

Filed Dec. 13, 1978, Ser. No. 969,168
Claims priority, application Switzerland, Dec. 22, 1977, 15912/77
Int. Cl.[3] G07D *3/12*
U.S. Cl. 133—3 F **4 Claims**



1. In a coin sorter of the type wherein coins lying against an inclined plate travel on a track past a plurality of sorting stations, each of which includes a detector having an actuating surface and an ejector associated with and following said detector along the route travelled by said coins, each said ejector being controlled by the associated said detector and including a deflector surface facing said detector, whereby when said ejector is moved to operative position by its associated detector, the coin located at said station is caused to ride along said deflector surface off of said track whereby it drops by gravity into collecting means located beneath the associated station, the improvement which comprises:

A pivotable feeler lever disposed after each said detector along said route and including a feeler-surface and

a thrust member associated with and following each said feeler lever along said route and controlled by the associated said feeler lever for assuming either a rest position wherein said thrust member is situated behind said plate or an operative position wherein said thrust member protrudes into the path of travel of said coins,

each successive said feeler-surface being situated at a lower level with respect to said track than that of the preceding said feeler-surface, and each said thrust member being situated at a predetermined distance from the associated said feeler lever as a function of the rate of travel of said

coins, whereby a movement of a said thrust member from said rest position into said operative position as controlled by the associated said feeler lever causes said thrust member to sharply strike one of said coins substantially in the center thereof to propel said coin over the top of said collection means for receipt by a separate receptable.

4,228,813

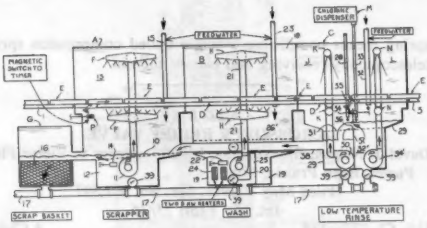
LOW TEMPERATURE CONVEYOR, RACK-TYPE DISHWASHER

Tore H. Noren, 3200 Lakeville Hwy., Petaluma, Calif. 94952

Filed Apr. 2, 1979, Ser. No. 26,016

Int. Cl.[3] B08B *3/02*

U.S. Cl. 134—47 **3 Claims**



1. In a dishwashing machine, a two compartment ware rinsing and sterilizing module wherein the first compartment is for rinsing the wash water and detergent from the ware and the second compartment is for secondary rinsing with a sterilizing agent added for permitting hot water 140° F., to be used to sterilize the ware;

(a) means for moving the ware successively through the first and second compartments;

(b) a first water receiving tank underlying the first compartment for receiving hot rinse water therefrom;

(c) a first water circulating means in the first tank for removing water therefrom and spraying it onto the ware in the first compartment for removing the washwater and detergent from the ware;

(d) means for feeding fresh hot water at 140° F. and for metering a sterilizing agent into a second tank underlying said second compartment;

(e) a second water and sterilizing circulating means in the second tank for drawing sterilizing water therefrom and spraying it onto the ware in the second compartment for rinsing and sterilizing the ware; and

(f) means for receiving overflow water from the second tank and delivering it to said first tank for maintaining the level of water in said first tank.

4,228,814

CLEANING APPARATUS FOR TEST ELECTRODES

Peter Luethi, Uster, and Werner Steinmetz, Wetkizon, both of Switzerland, assignors to Zellweger Ltd., Switzerland

Filed Sep. 25, 1978, Ser. No. 945,395

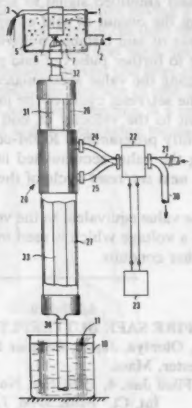
Claims priority, application Switzerland, Sep. 23, 1977, 11624/77

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—58 R **7 Claims**

1. A cleaning apparatus for test electrodes disposed in a vessel containing a solution to be analyzed by the test electrodes in which the test electrodes are adapted to be sprayed by a jet of cleaning solution issuing from a nozzle in accordance with a predetermined program, the cleaning apparatus comprising:

a pneumatically operating peristaltic pump means operatively connected with the nozzle for intermittently drawing the cleaning solution from a storage container and for ejecting the cleaning solution through the nozzle against



the test electrodes so as to remove deposits of solids therefrom while the test electrodes remain in the solution.

4,228,815

MEASUREMENT AND CONTROL OF MULTICOMPONENT LIQUID SYSTEMS

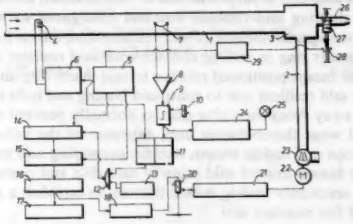
Richard Juffa, Cologne; Georg Wawra, Leverkusen, and Walter Uerdingen, Schildgen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 696,153, Jun. 14, 1976, abandoned. This application Jan. 11, 1978, Ser. No. 868,648

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527378

Int. Cl.[3] G05D *11/13*

U.S. Cl. 137—10 **11 Claims**



11. A method for dosing multicomponent liquid systems in which the liquids have viscosities between about 50 and 2000 cP; the flowrate is between about 50 and 100 cm^3/minute; and the components are conveyed by separate conduits into a mixing chamber comprising:

(A) injecting a thermopulse of between about 5 and 100 ms in duration into the liquid flowing in one of said conduits by means of a heater centrally mounted in the conduit carrying said liquid,

(B) simultaneously adjusting a bistable multivibrator to its set mode so that it allows pulses from a pulse generator to pass through a gate to a pulse counter,

(C) activating said pulse generator for at least one measurement cycle,

(D) detecting the arrival of the ascending flank of said pulse with a thermoelectric sensor mounted in said conduit between about 5 and 500 mm downstream of said heater,

(E) amplifying the detection signal of said sensor and passing it to a comparator,

(F) using said amplified signal to activate said comparator and using the output of said comparator to activate the reset mode of said bistable multivibrator thereby closing said gate to further pulses of said pulse generator,

(G) converting the value accumulated in said pulse counter during the set/reset cycle of the multivibrator to a value equivalent to the velocity of said liquid by means of a permanently programmed ROM-code converter, and

(H) storing the value accumulated in said impulse counter until the next set/reset cycle of the multivibrator is completed,

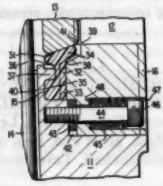
(I) using the value equivalent to the velocity of said liquid to generate a voltage which is used to control the flowrates in the other conduits.

4,228,816

FIRE SAFE BUTTERFLY VALVE

Tadashi Aoki, Ohmiya, Japan, assignor to Jamesbury Corporation, Worcester, Mass.

Filed Jan. 4, 1978, Ser. No. 866,870
Int. Cl.[3] F16K *5/06, 17/40*
U.S. Cl. 137—72 **6 Claims**



1. A butterfly valve comprising a housing defining a fluid flow channel, a shaft, a butterfly valve disc mounted on said shaft for rotation within said channel to control fluid flow therethrough, an annular resilient seat member circumscribing said channel to sealingly cooperate with the edge of said disc when said disc is perpendicular to said channel, a metal insert ring abutting said resilient seat and configured to provide a fulcrum against one side of said resilient seat, means for biasing said insert ring in sealing contact with said resilient seat, and fusible means positioned relative to said insert ring and spaced from said resilient seat to resist said biasing and hold the insert ring away from the valve disc to normally prevent metal-to-metal wear therebetween until exposure of the valve to fire destroys said fusible means, thereby permitting said insert ring to be biased toward said edge of said disc and contact same with secondary sealing means thereon to establish a metal-to-metal fire resistant seal.

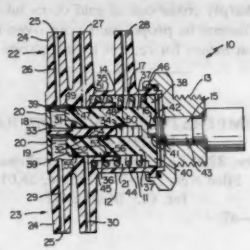
4,228,817

VALVE CONSTRUCTION HAVING MULTIPLE PISTON MEANS

Marvin P. Weaver, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 1, 1978, Ser. No. 911,403
Int. Cl.[2] F16K *27/04, 11/06*
U.S. Cl. 137—79 **14 Claims**

1. In a valve construction having a housing means provided with a chamber and port means leading to said chamber and having an axially movable piston means disposed in said chamber to interconnect certain of said port means together in relation to the axial position of said piston means that is caused by a condition responsive device and a spring means operatively associated with said piston means, the improvement wherein said piston means comprises a plurality of pistons disposed in spaced substantially parallel relation and being secured together to be axially moved in unison in said chamber under the influence of said condition responsive device, said



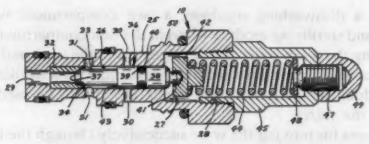
spring means comprising a single coiled compression spring telescopically receiving said pistons therein.

4,228,818

CROSSOVER RELIEF VALVE

David J. Nelson, Bloomington, Minn., assignor to Victor Fluid Power, Eden Prairie, Minn.

Filed May 1, 1978, Ser. No. 901,597
Int. Cl.[3] F15B *11/16*
U.S. Cl. 137—115 **4 Claims**



1. A crossover relief valve for use in a hydraulic system having a pair of single acting hydraulic jacks and a reservoir which comprises,

(a) an elongated tubular valve body having a passageway extending axially therethrough, the body forming a first port at one end of the passageway adapted to be connected for fluid communication with one of said jacks,

(b) a closure means connected to the body closing the other end of the passageway,

(c) a piston disposed for axial sliding movement in the passageway between closed, partially open and fully open positions,

(d) a coil spring disposed within the passageway in compressed condition between the closure means and piston to yieldably retain the piston in a closed position over said first port,

(e) the body having second and third ports in its tubular wall spaced different distances from the first port and both communicating with the passageway, said ports respectively adapted to be connected for fluid communication with the other jack and the reservoir,

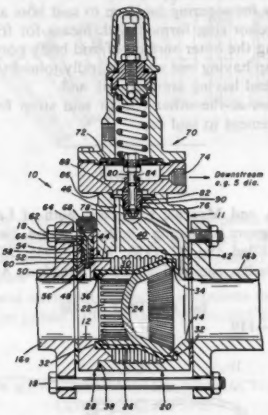
(f) the piston having a reduced portion between the first and second ports whereby, as the piston is displaced to a partially open position from a closed position, the first and second ports will have open communication through the passageway, and

(g) said piston having a shoulder located between the second and third port when the piston is in closed position or in said partially open position providing a closure between the passageway and the third port but adapted to move past and open the third port to the passageway when the piston is moved to its open position, said shoulder having a surface facing away from the spring means which is exposed to fluid pressure in both the first and second ports when the piston is in partially open position.

4,228,819
AXIAL FLOW THROTTLING VALVE

John M. Kruse, and Leland E. Gelnett, both of DuBois, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 697,492, Jun. 18, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 925,069
Int. Cl.[3] G05D *16/16*
U.S. Cl. 137—489 3 Claims



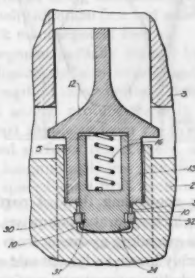
1. A self-contained valve assembly for controlling the flow of gaseous fluid in a pipeline to maintain uniform downstream pressure with varying downstream load, comprising a housing having a main fluid passage therethrough, cage means and a resilient boot member in said main passage for controlling the flow of fluid therethrough, a chamber formed in the housing around at least a portion of said boot means, upstream passage means wholly contained in said housing connecting said chamber with said main passage at a point upstream of said cage, a variable restriction in said upstream passage means to control the rate of entry of upstream control fluid into said chamber, downstream passage means wholly contained in said housing connecting said chamber with said fluid passage at a point downstream of said cage, diaphragm controlled pilot valve means mounted on said housing having a control valve projecting into said downstream passage means to control the flow of control fluid out of said chamber through said downstream passage means, and means on said pilot valve means to facilitate a fluid connection between the diaphragm of said valve means and said pipeline downstream of said valve.

4,228,820
SEAT GUIDED POPPET VALVE HAVING FLOW AND DAMPENING CONTROL MEANS

Richard M. Deminski, Mount Vernon, Ohio, assignor to The Yorde Machine Products Company, Nelsonville, Ohio

Filed Dec. 30, 1977, Ser. No. 866,033
Int. Cl.[3] F16K *15/02*
U.S. Cl. 137—514.3 23 Claims

1. A seated guided poppet valve comprising a seat, a guard mated with said seat and a poppet element movable longitudinally within said guard and seat, said seat having a bore extending therethrough with an inlet port and an outlet port, said inlet port adapted to communicate with a source or sink of fluid, said guard having a first bore therein coaxially communicating with said seat bore and a second bore coaxial with and of lesser diameter than said first bore, said first bore being connected to at least one fluid channel, said poppet element comprising a substantially mushroom-shaped body having a cylindrical stem terminating at one end in a cap-like head, said head having seat-enaging means for forming a substantially fluid-tight seal against said seat, said head terminating in a plurality of elongated vane-like flutes slidingly received within said seat bore and extending radially outward from the longitudinal axis of said poppet element, each of said flutes having a seat abutting surface along the longitudinal edge of the flute for guiding said poppet element solely within said seat bore, said poppet element being guided exclusively by said seat bore as said element reciprocates longitudinally, the junction of said flutes and said head forming concave surfaces extending in a smooth surface between said flutes and said seat engaging means for directing

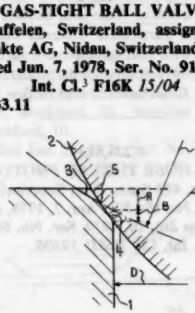


the flow of fluid thereacross to reduce turbulence, said stem being received for longitudinal reciprocating movement within said second guard bore and containing a coaxial bore, said valve further including a compression spring contained within said stem bore and cooperating with said second guard bore for urging said poppet head toward said seat, whereby said seat engaging surface of said poppet head abuts said seat when said valve is closed to prevent fluid flow through said valve and is spaced from said seat when said valve is open to permit fluid flow through said valve.

4,228,821
GAS-TIGHT BALL VALVE

Karl Stark, Täuffelen, Switzerland, assignor to Saphirwerk Industrieprodukte AG, Nidau, Switzerland

Filed Jun. 7, 1978, Ser. No. 913,575
Int. Cl.[3] F16K *15/04*
U.S. Cl. 137—533.11 6 Claims



1. A gas-tight ball valve having a ball loosely resting on a valve seat made each of hard material, said valve seat being formed on a seat body having a bore and a face extending substantially radially outwardly from said bore, said valve seat being formed at the boundary between said bore and said face and having a broken edge between an inner spheric annular surface adjacent said bore and an outer spheric annular surface adjacent said face, each of said spheric annular surfaces having a radial width, the diameter of said valve bore, the radius of the ball, the radial width of said inner annular surface and the radial width of said outer annular surface being in a proportion of substantially 120:75:3:5.

4,228,822

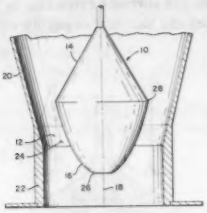
STREAM THROTTLE

Glen W. Fisher, Bellevue, Wash., assignor to Technovators, Inc., Seattle, Wash.

Continuation of Ser. No. 795,419, May 9, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 940,989

Int. Cl.[3] **D03D** *39/20*

U.S. Cl. 138—46 **7 Claims**



1. Apparatus for controlling flow of particulate material through an orifice, which apparatus comprises means for forming a hopper surface extending upstream from said orifice, and a flow control assembly located adjacent said orifice, said flow control assembly including an upstream surface, said upstream surface having means for directing particulate material toward said hopper surface upstream from said orifice and control zone forming means for forming a flow control zone immediately above said orifice in which the rate of increase in velocity of particulate material flow is minimized as the particulate material approaches said orifice, said control zone forming means including a downstream surface connected to said upstream surface, said downstream surface formed as a surface of revolution having a parabolic vertical cross-section, said downstream surface curving away from said hopper surface in vertical cross-section while being spaced from said hopper surface and means mounting said flow control assembly relative to said hopper surface to cause said downstream surface to extend partially through said orifice for maintaining uniform flow of particulate material from said hopper surface toward said orifice with the particulate material making essentially continuous contact with said downstream surface to minimize the rate of increase in velocity of particulate material as the particulate material flows toward said orifice.

4,228,823

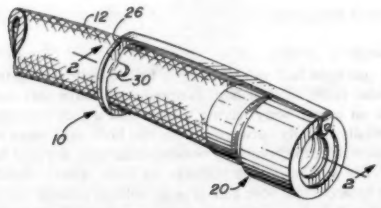
GARDEN HOSE THREAD PROTECTOR

Lamberto C. Zepeda, 492 Santa Rita, Superior, Ariz. 85273

Continuation of Ser. No. 894,571, Apr. 7, 1978, abandoned. This application Jul. 10, 1979, Ser. No. 56,339

Int. Cl.[3] **B65D** *59/06*

U.S. Cl. 138—96 R **7 Claims**



1. A garden hose comprising:

a. a flexible tubular body portion including,

i. an outer surface, and

ii. a free end; and

b. a nipple secured to the free end of said body portion and including,

i. external threads, and

ii. an end;

in combination with a protector for said nipple, comprising:

c. a protective cap including,

i. a cylindrical wall engaged with the external threads of said nipple, and

ii. an inturned flange integral with said wall and overlying the end of said nipple, and

d. a tether for securing said cap to said hose and including,

i. an anchor ring formed with means for frictionally engaging the outer surface of said body portion,

ii. a strap having one end integrally joined to said anchor ring and having another end, and

iii. means at the other end of said strap for detachable securement to said cap.

4,228,824

HOSE

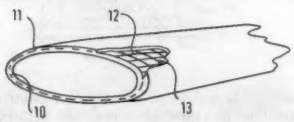
Brian Evans, and Maurice Calverley, both of Lancaster, England, assignors to Dunlop Limited, London, England

Filed Aug. 22, 1978, Ser. No. 935,755

Claims priority, application United Kingdom, Aug. 25, 1977, 35661/77

Int. Cl.[3] **F16L** *11/08*

U.S. Cl. 138—119 **14 Claims**



1. A hose of the layflat type comprising a reinforcement structure having warp elements extending along the length of the hose in a direction generally parallel to the direction of the length of the hose, the warp elements comprising plied yarns formed of filaments of a material having a modulus greater than 1.2 g/decitex which resist longitudinal extension of the hose, and said warp elements having a twist greater than 160 turns per meter to assist in providing stability to the hose wall when compressed during curving of the hose under hydraulic pressure.

4,228,825

TRANSMISSION LINE CARRIER

Werner Moritz, Siegen; Kurt Loos, Netphen, and Friedrich Haschek, Siegen, all of Fed. Rep. of Germany, assignors to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Jan. 9, 1979, Ser. No. 2,194

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1978, 2805832

Int. Cl.[3] **F16L** *11/18*

U.S. Cl. 138—120 **23 Claims**

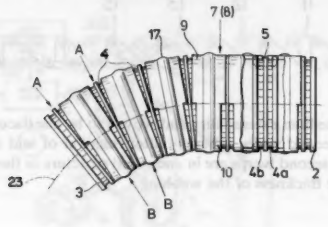
1. A self-supporting transmission line carrier between a moveable consumer and a stationary connection comprising

a row of a plurality of two adjacent tubular members articulated only in one direction with respect to one another and engaged in one another including, wide tubular members each with inwardly directed abutments and narrow tubular members each with outwardly directed abutments alternatingly arranged slidably engaged in each other, said tubular members having a non-circular cross-section thereby being axially non-rotatable relative to each other,

the narrow tubular members each forming a channel thereabout by and between said outwardly directed abutments thereof,

each of said wide tubular members is shortened on both sides thereof viewed in a longitudinal direction of the transmis-

sion line carrier in the vicinity of a longitudinal cross-section half of the transmission line carrier, a bottom end portion of each said wide tubular members relative to a top end portion of each said wide tubular members is shorter in said longitudinal direction approximately by the width of said channel in the longitudinal directions,



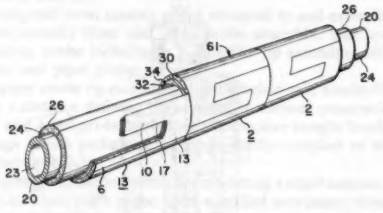
each of said wide tubular members comprises two tubular member halves each with a U-shaped cross-sectional form, said tubular member halves are pushed together on said narrow tubular members with respect of said inwardly and outwardly directed abutments interengaging so as to be joined to form said transmission line carrier.

4,228,826

INTERLOCKING, LAMINATED REFRACTORY FOR COVERING A PIPE

Frank Campbell, Jr., 2274 Broadlawn Dr., Houston, Harris County, Tex. 77058

Filed Oct. 12, 1978, Ser. No. 950,633
Int. Cl.[3] F27D *9/00, 3/02*
U.S. Cl. 138—149 **3 Claims**



1. A laminated cylindrical refractory produced by forming a first slurry of ceramic fibers, water and a binder,

submerging a perforated cylindrical mold into the slurry, the perforations of said mold in communication with a partial vacuum source which tends to draw the slurry toward the perforated vacuum mold;

permitting the ceramic fibers of the first slurry to be deposited as a substantially cylindrical inner ceramic fiber layer upon the exterior of the perforated mold;

withdrawing the perforated mold and the deposited inner layer from the slurry when a desired thickness of the inner layer has been deposited upon the perforated mold;

superimposing a mesh reinforcement around the inner layer;

forming a second slurry of ceramic fibers, water and a binder, the fibers in said slurry being more resistant to slag attack, high temperature and corrosive gases than the fibers in the first slurry;

submerging the perforated mold, inner layer and superimposed mesh into the second slurry and communicating a partial vacuum through the mold perforations and through the inner layer such that an amount of the second slurry is drawn toward the inner layer and the metal mesh;

permitting an amount of the ceramic fibers in the second slurry to be deposited on the mesh and the inner layer as outer ceramic fiber layer;

withdrawing the perforated mold, inner layer, mesh and outer layer from the second slurry;

removing the perforated mold from the inner layer, mesh and outer layer, thereby leaving a substantially cylindrical, laminated refractory;

curing the laminated refractory until the desired rigidity is achieved;

forming substantially radial edge surfaces at each end of the cylindrical laminated refractory;

severing the cylinder along substantially radial surfaces into two substantially identical first and second main segments, whereby each main segment forms:

(a) a body segment partially defined by first and second radially aligned surfaces extending longitudinally less than the length of the cylindrical, laminated refractory,

(b) first and second protuberances in proximity to and spaced apart angularly from the first and second radially aligned surfaces respectively, said protuberances extending longitudinally less than the body segment and angularly spaced apart from each other by a void, and

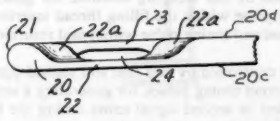
(c) first and a second recesses bounded longitudinally by the first radially aligned surface and the first protuberance and the second radially aligned surface and the second protuberance respectively, wherein the body segment, first and second protuberances and the first and second recesses for each main segment are positioned on a common cylindrical radius such that when the first and second main segments are axially aligned and urged longitudinally together, the first body segment and the second body segment occupy the void of the second main segment and the first main segment respectively, the first and the second protuberances on the first main segment are closely received by the first and second recesses respectively of the second main segment, and the first and second protuberances of the second main segment are closely received by the first and second recesses respectively of the first main segment, thereby forming an interlocking, laminated refractory of substantially the same cylindrical shape of the refractory as removed from the perforated mold.

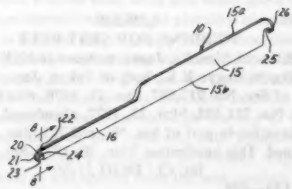
4,228,827

HEDDLE FOR A WEAVING MACHINE FOR MAKING TRIAXIAL FABRICS

Wayne C. Trost, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Jan. 30, 1979, Ser. No. 7,760
Int. Cl.[2] D03C *13/00*
U.S. Cl. 139—93 **12 Claims**





1. An elongate heddle for a weaving machine for making

triaxial fabrics wherein the heddle is adapted to be moved longitudinally during a warp shed forming operation and also is adapted to be shifted weftwise of the weaving machine, said heddle being an elongate strip material and comprising a frontal portion terminating in a nose portion comprising a rounded free end and a warp strand guide portion having a warp strand guide opening extending therethrough wherein the improvement comprises said nose portion being of substantially the same thickness as the major portion of said frontal portion and said warp strand guide portion is formed to provide a warp strand path which is at least partially within the thickness dimension of the nose portion.

4,228,828

ELECTRONIC THREAD MONITORING DEVICE FOR GRIPPER SHUTTLE WEAVING MACHINES

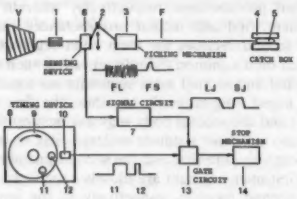
Erich Loepfe, Pfaffhausen, and Erich Weidmann, Wetzikon, both of Switzerland, assignors to Gebrüder Loepfe AG, Zürich, Switzerland

Filed Oct. 30, 1978, Ser. No. 956,277

Claims priority, application Switzerland, Nov. 1, 1977, 13374/77

Int. Cl.[2] D03D *51/34*

U.S. Cl. 139—370.2 **6 Claims**



1. In a gripper shuttle weaving machine provided with means for picking the gripper shuttle, means for receiving and stopping the gripper shuttle at the end of each filling thread insertion, means for returning the gripper shuttle from a stop position into a defined thread releasing position, and means for tensioning the filling thread during the returning interval of the gripper shuttle, the improvement which comprises:

an electronic thread monitoring device comprising means arranged at the picking side of the weaving machine for sensing the filling thread and producing a first signal indicative of thread travel and a second signal indicative of thread tensioning;

sensing means comprising at least one transducer system generating a first high frequency signal indicative of thread travel and a second low frequency signal indicative of thread tensioning during said returning interval;

means actuated by the weaving machine for generating a first timing pulse within the filling thread insertion interval, and a second timing pulse within said returning interval; and

gating means controlled by said first and second signals and first and second timing pulses, for generating a stop signal when no first or second signal exists during the first and second timing pulses, respectively.

4,228,829

WEBBING FOR SEAT BELT

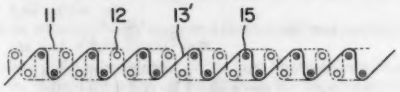
Kouichi Kikuchi, Sizuoka, Japan, assignor to NSK-Warner K.K. and Kikuchi Kogyo K.K., both of Tokyo, Japan

Division of Ser. No. 917,587, Jun. 21, 1978, which is a division of Ser. No. 781,433, Mar. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,771, Jan. 27, 1976, abandoned. This application Mar. 30, 1979, Ser. No. 25,573

Int. Cl.[2] D03D *11/00*

U.S. Cl. 139—408 **2 Claims**

1. An energy-absorbing webbing for seat belts of at least double weave structure comprising first wefts of high extensibility, second wefts of water-soluble threads to be removed after weaving the webbing, the first and second wefts being alternately arranged, first warps of high extensibility interlaced with the first wefts, and second warps selected from threads of



low and medium extensibility and woven to be interlaced with only the second wefts, whereby after removal of said second wefts said second warps are in undulated structure in the direction of the thickness of the webbing.

4,228,830

METHOD AND DEVICE FOR MANUFACTURING A SINGLE-PIECE BINDER WITH A HANGER FOR SHEET PACKS

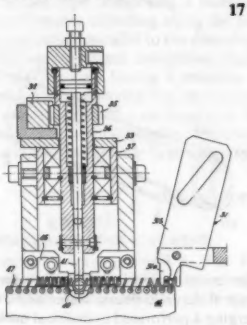
Hratch Boyadjian, Seestrasse 19, CH-8703 Erlenbach, Switzerland

Filed Mar. 29, 1979, Ser. No. 25,086

Claims priority, application Switzerland, Apr. 5, 1978, 3634/78

Int. Cl.[3] B21F *35/02*

U.S. Cl. 140—102 **17 Claims**



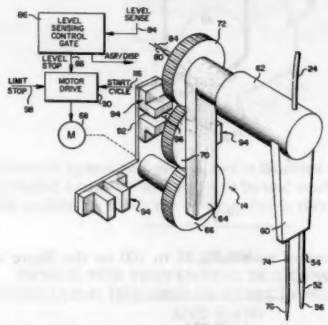
1. A method of forming a hanger eye in a wire binding comprising the steps of: forming a plurality of parallel loops in a continuous wire, each extending through a stack of sheets adjacent one edge thereof to bind the stack of sheets together; forming a recess in the one edge of the stack of sheets having at least one loop therein which does not extend through the stack of sheets; supporting the bound stack with the recess exposed; providing a pair of tongs forming a loop-clamping jaw which can be closed to grasp a loop; moving the tongs into the recess in a direction perpendicular to the edge of the stack and around at least one loop within the recess; closing the jaw to grasp the at least one loop in the recess; rotating the jaw with grasped loop to rotate the loop approximately 90° in the recess and form a hanger eye; opening the jaw to release the loop now in the form of a hanger eye; and moving the tongs away from the recess in a direction perpendicular to the stack eye.

4,228,831

PROBE AND SYRINGE DRIVE APPARATUS

Ralph M. Kerns, Dallas, Tex., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 11, 1978, Ser. No. 968,151
Int. Cl.[3] B65B *3/32*
U.S. Cl. 141—27 **3 Claims**



1. In automatic dispensing apparatus for sequentially transferring liquids from a plurality of sample containers having different sample levels to respective analysis containers, including a pipet probe assembly having an elongated pipet probe, probe drive means for inserting said pipet probe into said sample and moving said pipet probe assembly between said sample containers and said analysis containers, aspirating means for aspirating a respective sample into said probe, and dispensing means for dispensing the aspirated sample into said respective analysis containers, the improvement comprising:

said pipet probe having a beveled tip with the angle of said bevel being about 25°–35° with respect to the longitudinal axis of said tip:

an elongated level sensing probe mounted to and extending downwardly from said pipet probe assembly, said level sensing probe including a needle-like tip extending adjacent said pipet probe;

said pipet probe tip extending slightly below said needle-like tip a distance defining the amount of minimal penetration of said pipet probe tip below a respective sample level;

syringe means including a syringe fluidly coupled to said pipet probe,

said syringe means including for aspirating a small amount of air into said pipet probe upon signalled movement of said probe assembly towards said sample containers said immediately prior to said pipet probe tip entering said sample to prevent dilution of said sample;

and control means coupled intermediate said syringe means, said level sensing probe and said probe drive means, for signalling said movement of said probe assembly towards said sample container and responding to said needle-like tip contacting the level of a respective sample to stop said probe drive means to minimize the penetration of said pipet probe tip below the level of said respective sample.

4,228,832

VACUUM ENCAPSULATING APPARATUS

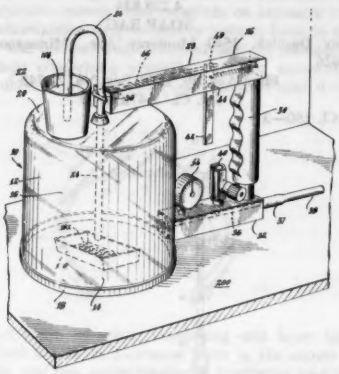
Frank R. Brown, 84 Stony Hill Rd., Brookfield Ctr., Conn. 06805

Filed Feb. 13, 1978, Ser. No. 877,268
Int. Cl.[2] B65B *31/02*
U.S. Cl. 141—51 **17 Claims**

1. Portable vacuum potting apparatus comprising

a bell having an interior chamber that has a bottom opening, the edge region of which is adapted for juxtapositioning to an associated surface in vacuum tight relationship thereto, and an associated carrying handle,

said apparatus including means for interconnecting the interior of said bell with a vacuum source and fluid conduit means describing a flow-path to the interior of said bell through which fluid may pass from an associated container,



and said handle including regulating means for regulating the flow of fluid through said fluid conduit.

4,228,833

ECOLARIUM AQUARIUM FILLER

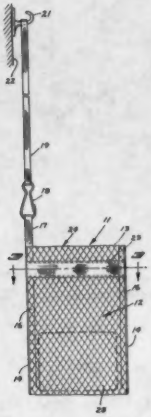
Otto A. Roehrick, 1333 Elkhorn Blvd., Rio Linda, Calif. 95673

Filed Oct. 4, 1976, Ser. No. 729,307
Int. Cl.[2] B65B *39/00*; B67C *11/02*
U.S. Cl. 141—340 **2 Claims**

1. An ecolarium filler comprising an output container member having a solid bottom wall, solid side walls and a top wall having a portion thereof containing a plurality of small appertures of uniform size and shape, an upper input container member being substantially co-extensive with said output container member and having an opening in the top thereof, and a conduit providing a fluid passage way extending from the bottom of said input container member through the top of the said output container member, said input container member having a wall extending beyond a portion of the bottom wall thereof and being parallel to and spaced from the said conduit, the said extended wall, the said bottom portion and the said conduit combined forming a C-shaped channel anchoring means for

securing the filler and aligning the same to a vertical wall of a ecolarium.

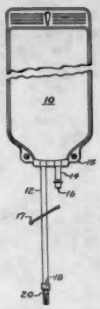
4,228,834
SOAP BAG
Shirley Desnick, 2540 Monterey Ave., Minneapolis, Minn. 55426
Filed Aug. 30, 1979, Ser. No. 71,745
Int. Cl.³ A47K *7/03*
U.S. Cl. 150—3 **5 Claims**



1. A bag for hand soap comprising
a strip of plastic mesh fabric folded together to provide front and rear sections, the sides having inwardly extending flap portions, and the upper edge having inwardly and downwardly extending flap portions,
a pair of narrow strips disposed between the inwardly extending flap portions of the front and rear sections, and stitched to such inwardly extending portions to provide a bag having a bottom and closed sides, one of the strips having a loop segment extending above the mouth of the bag,
a band of fabric running around the mouth of the bag at a point down from the top thereof, the band being stitched to the front and rear sections of the mesh fabric and also to the inwardly and downwardly extending flap thereof,
a Velcro fastener stitched to the fabric band within the mouth of the bag to allow temporary closing of the bag, and
a strap secured to the loop segment of the narrow strip stitched to one side of the bag.

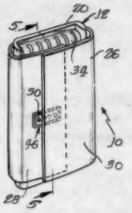
4,228,835
BREAKAWAY CAP FOR SOLUTION CONTAINERS
Carleton D. Robinson, Des Plaines, Ill., and Jack J. A. Debrauwere, Roosdaal, Belgium, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Feb. 23, 1979, Ser. No. 14,443
Int. Cl.³ B65D *41/32*
U.S. Cl. 150—8 **9 Claims**

1. In a container of the type having a flexible tube extending therefrom and having a first connector at the distal end of the flexible tube for connecting to a second connector, the improvement comprising: a breakaway cap connected to said first connector which normally closes the first connector to fluid flow but which opens the fluid flow path when the cap is broken away, said breakaway cap having a frangible annular section of reduced thickness, and handle means extending longitudinally outwardly from said breakaway cap and first connector along the axis of said breakaway cap, said breakaway cap comprising a molded member made of a flexible plastic similar in physical properties to polyvinyl chloride and



having a hardness of essentially 85 to 100 on the Shore A Durometer scale.

4,228,836
KEY CASE
Donald McFarland, Santa Barbara, Calif., assignor to Amity Leather Products Company, West Bend, Wis.
Filed Aug. 15, 1979, Ser. No. 66,650
Int. Cl.³ A45C *11/32*
U.S. Cl. 150—40 **3 Claims**

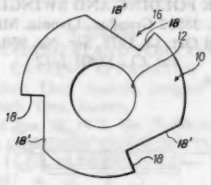


1. A key case comprising a rigid rectangular open-top box member for providing shape and rigidity to the key case; a plurality of key retaining members operably fixed to the interior of said rectangular box member; a flexible flap member received through slots extending along the edges of the rectangular member for folding over the open top of said rectangular box member; and means for releasably fastening the ends of said flap to each other.

4,228,837
LOCKING WASHERS
Keith Lyons, 37 Heswall Mount, Thingwall, Wirral, Cheshire, England
Filed Apr. 25, 1978, Ser. No. 899,779
Claims priority, application United Kingdom, Apr. 28, 1977, 17740/77
Int. Cl.³ F16B *39/14, 39/02*
U.S. Cl. 151—35 **2 Claims**

1. A washer having a screw-thread formed in a central bore thereof to enable the washer to be screwed onto a screw-threaded bolt member the washer being adapted for tensioning itself against a surface when screwed up against the surface for increasing friction between the washer and the screw-threaded member; wherein the washer is resilient and substantially dish-shaped for tensioning itself against said surface, and is formed with at least one peripheral recess therein defined by two edges one of which passes substantially radially inwardly from the

periphery of the washer and the other of which passes along a line such that said one edge is not faced by said other edge of the recess, such that when said washer is screwed up and



tensioned against said surface and in flattened condition, there is exerted a constant locking force by said washer regardless of the position to which the bolt member is thereafter screwed.

4,228,838

DEVICE FOR PREVENTING SKIDDING AND FOR INCREASING THE GRIP OF VEHICLE WHEELS ON ICE AND SNOW

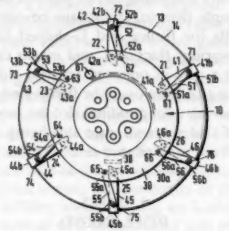
Hellmuth Zerlauth, Innsbruck, Austria, assignor to Niveau AG, Basel, Switzerland

Filed Nov. 3, 1978, Ser. No. 957,099

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750111

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—216 **24 Claims**



1. An anti-skid mechanism for a vehicle wheel which includes a wheel rim having an axis of rotation comprising: a first member affixed to said wheel and extending generally transversely relative to said wheel axis; a second member axially spaced from said first member on a side thereof opposite said wheel and also extending generally transversely relative to said axis; means for rotating said second member relative to said first member about said axis; a plurality of anti-skid arms pivotally mounted on said first member; and lever means pivotally mounted between each of said anti-skid arms and said second member to drive said anti-skid arms between an operative position and an inoperative position by rotation of said second member relative to said first member.

4,228,839

SELF-SEALING PNEUMATIC TIRE

Georg G. A. Böhm, Akron, and Mario DeTrano, Massillon, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 3, 1978, Ser. No. 930,769

Int. Cl.³ B60C *5/14, 17/00*

U.S. Cl. 152—347 **8 Claims**

6. A self-sealing pneumatic tire comprising an annular road-engaging tread surface, two sidewalls each connecting a side of said tread surface to an annular bead, reinforcing body plies extending from one bead to the other through the sidewalls and tread and a puncture-sealant layer located in the crown area of said tire radially inward of said reinforcing body plies, said puncture-sealant layer comprising a blend of a first polymeric material that degrades on exposure to irradiation and a second polymeric material that crosslinks on exposure to irradiation, vulcanization temperatures or both to form an elastic matrix for said first polymeric material, said tire manufactured by the steps comprising providing a layer comprised of blended rubber compound with said blend of said first and

second polymeric materials, assembling said layer into an unvulcanized tire as its innermost layer in the crown area, vulcanizing said tire, and subsequenty irradiating said tire to degrade said first polymeric material whereby said first polymeric material forms a tacky material in said second crosslinked polymeric material which acts as an elastic matrix for said first polymeric material, whereby said layer with said polymeric material combination has puncture sealing properties.

4,228,840

SAFETY WHEEL

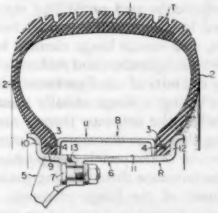
Motohiro Okada, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1978, Ser. No. 933,117

Claims priority, application Japan, Aug. 12, 1977, 52-108408[U]

Int. Cl.³ B60C *5/12*

U.S. Cl. 152—400 **2 Claims**



1. A safety wheel apparatus employing, a tubeless tire mounted on a rim about the periphery thereof, said rim being formed with flange members; an air chamber defined by said rim and said tubeless tire, a bead stopper disposed within said air chamber for gripping portions of said tubeless tire in cooperation with said flange members to contain bead portions of said tire against axial displacement relative to said rim; said bead stopper being defined by a plurality of interconnected rigid circular bead stopper units, one of at least a pair of said interconnected bead stopper units being formed at one end with a male connecting section having connecting pins, and another end thereof formed with a female connecting section having hook-like locking concave portions, said locking concave portions and connecting pins of said female and male section respectively, being disengageably connected to each other, wherein: said bead stopper units are flexibly connected in a radial direction thereof so as to form an endless configuation with an inner peripheral surface thereof fitted into a rim base of said rim; said rim being further defined by an outboard

section with a body portion formed by a base of narrow width and a first flange member integrally formed along an outer edge of said portion and an inboard section with a body portion formed by a base of a width greater than said body portion of said outboard section and a second flange member integrally formed along an outer edge of said inboard body portion, said outboard and inboard portions being respectively affixed to one another by bolt means to enable cooperative placement with said bead stopper.

4,228,841

EXTRUDED MATERIAL FOLDING DOOR WITH PANEL LOCK

Guy E. Dixon, Miami, Fla., assignor to Panelfold Doors, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 243,734, Apr. 13, 1972, Pat. No. 3,972,365. This application Jun. 4, 1975, Ser. No. 583,525

Int. Cl.[2] E05D *15/26*

U.S. Cl. 160—183 **6 Claims**

1. A folding closure comprising a plurality of elongated vertical panels, hinge means connecting the vertical side edges of adjacent panels together to enable relative pivotal movement of the adjacent panels for extending and retracting the closure during movement between closed and open positions, each hinge means comprising a continuous male hinge element on one side edge of each panel and a continuous female hinge element on the other side edge of each panel, said male and female hinge elements being interengaged by relative end to end longitudinal movement between adjacent panels, and means associated with said hinge elements to preclude relative longitudinal movement between adjacent panels while permitting relative pivotal movement therebetween, said means including projecting means stationary with respect to one of the hinge elements and engaged with recess means in the other hinge element to prevent relative longitudinal movement between the hinge elements, said projecting means and recess means being spaced longitudinally inwardly from the ends of the hinge elements, said female hinge element being of generally channel-shaped configuration and said male hinge element being of generally cylindrical configuration with each of the hinge elements including a longitudinally continuous throat arranged so that when the entrance throats are registered in end to end relation, the hinge elements are interconnected by longitudinal movement of the panels to a position alongside of each other with the entrance throats being such as to prevent lateral disengagement of the hinge elements, said channel-shaped hinge element having said projecting means stationary with respect thereto and said cylindrical hinge element having said recess means therein receiving the projecting means, said means associated with said hinge element being in the form of a locking member, said locking member being stationarily engaged with the channel-shaped hinge element and including a projecting means interiorly thereof engaged with the recess means in the cylindrical hinge element, said channel-shaped hinge element including an opening through the bight portion thereof, said locking member including a plate engaging the exterior of the bight portion and said projecting means including a lug projecting from the plate, said lug extending through the opening in the bight portion of the channel-shaped hinge element and engaged in said recess means, said recess means being in the form of a slot through the generally cylindrical male hinge element, said channel-shaped hinge element including a flange opposite to and generally paralleling the bight portion with said flange being imperforate, said lug extending completely through the slot and terminating in a flat end surface adjacent the flange thereby being cantilever supported solely from the bight portion of the channel-shaped hinge element.

4,228,842

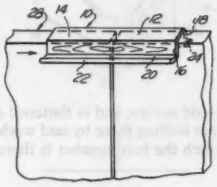
LATCH FOR FOLDING AND SWINGING DOORS

Richard J. Clark, 38582 Grandon, Livonia, Mich. 48150

Filed Oct. 13, 1978, Ser. No. 950,994

Int. Cl.[3] E06B *3/12*

U.S. Cl. 160—234 **4 Claims**



1. A latch for a multi-panel door comprising at least a pair of juxtaposed aligned panels when said door is closed, said latch comprising a U-shaped channel member slidably disposed over the top edge of one of the panels forming said door and slidable to a position straddling over the top edges of both panels when said panels are aligned with each other, said U-shaped channel member having a pair of opposite substantially parallel sidewalls and at least one of said sidewalls being provided with an integral outwardly extending flange portion disposed substantially at right angle thereto, and means co-operating with one of said sidewalls for fitting said U-shaped channel member over panels of various thickness, said means comprising a rail member having a pair of opposed exterior side surfaces, said rail member being slidable over the flanged edge of one of the sidewalls and having a longitudinal slot for mounting over the flanged edge of said sidewall, said slot being disposed at unequal distance from each of said side surfaces.

4,228,843

ROLL BLIND

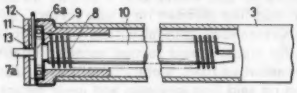
Hitoshi Kobayashi, c/o Yokota Inc. of No. 7-2, 5-chome, Ueno, Taito-ku, Tokyo, Japan

Filed Apr. 21, 1978, Ser. No. 898,861

Claims priority, application Japan, May 7, 1977, 52-57862[U]

Int. Cl.[2] E06B *9/208*

U.S. Cl. 160—306 **6 Claims**



1. A roll blind comprising an elongated cylindrical roll member having an open end and an internal chamber adjacent to said open end, a winding shaft rotatably mounted within said chamber having an end portion extending beyond said open end, spring means disposed within said chamber connected between said winding shaft and said roll member for rotating said roll member relative to said winding shaft, a winder disposed adjacent to said open end and operatively connected to said end portion for winding said winding shaft and tensioning said spring means, engaging means engageable with said roll member and said winder for preventing relative rotation between said winder and said roll member, said engaging means being withdrawable from said winder and said roll member to permit relative motion therebetween, and said winder including a substantially planar body and a rimmed edge transversely

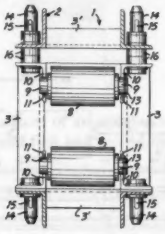
extending from a side of said body disposed adjacent to said open end, and means formed within said body for receiving said engaging means including rim passages extending through said rimmed edge at oppositely disposed locations.

4,228,844

STRAND GUIDING STAND FOR CONTINUOUS CASTING APPARATUS

Werner Scheurecker, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 23, 1978, Ser. No. 918,472
Claims priority, application Austria, Jul. 7, 1977, 4866/77
Int. Cl.³ B22D *11/128*
U.S. Cl. 164—448 **8 Claims**



1. In a strand guiding stand to be used in a continuous casting plant, in particular a casting plant for billets or bloom, and of the type including longitudinal beams and cross beams forming a cage-like carrying structure and strand guiding rollers for guiding a strand along a strand guide path and having roller axles, said strand guiding rollers being mounted in said cage-like carrying structure, the improvement comprising

roller holding means accommodating the roller axles and being fastened to the longitudinal beams independently of the cross beams, thereby fastening the strand guiding rollers of each side of the strand guiding stand directly to the longitudinal beams, independently of the cross-beams, said roller holding means having an L-shaped cross section taken normal to a longitudinal axis of an associated longitudinal beam with one section accommodating the roller axles and the other section, which is at a right angle with the one section, being detachably mounted directly to the pertaining longitudinal beam; and

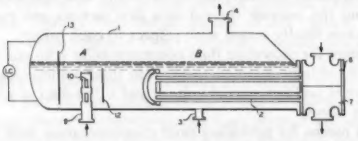
pins directed substantially perpendicular to the strand guide path, longitudinal beam and associated other section of said roller holding means for mounting the roller holding means on the longitudinal beams, each of said pins penetrating a longitudinal beams and the associated other section of the holding means.

4,228,845

CHILLER WITH MEANS FOR MIXING HOT VAPORS WITH COLD OR REFRIGERATED LIQUID

Edgar C. Cowling, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 26, 1978, Ser. No. 872,705
Int. Cl.² F28B *9/04*; F28F *9/22*
U.S. Cl. 165—1 **17 Claims**



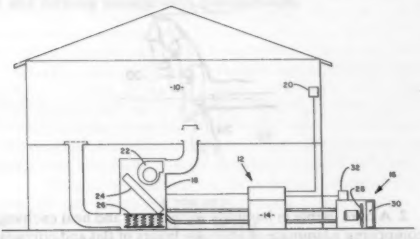
7. A shell and tube type heat exchanger, said shell being substantially horizontally disposed and having positioned therein a nest of tubes, chilling introducing means for introducing chilling medium into said shell into contact with said tubes, said tubes being adapted to be cooled directly by chilling medium introduced to within said shell through said introducing means to surround said tubes, said tubes extending within said shell from one end portion thereof toward but not completely to the other end thereof leaving a section at the other end of said shell not containing any portion of said nest of tubes, means for maintaining said tubes substantially submerged in chilling medium liquid within said shell and a level of liquid surrounding said tubes below the upper portion of said shell to provide a vapor removal and collection from the surface of said liquid, an inlet for hot vapors in direct open communication with said section at said other end of said shell adapted for the direct introduction of vapor into liquid in said section and a baffle in said section disposed between said inlet and said nest of tubes whereby to prevent any of said hot vapors from causing disturbance of chilling medium in said shell surrounding said tubes.

4,228,846

CONTROL APPARATUS FOR A TWO-SPEED HEAT PUMP

Michael E. Smorol, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,259
Int. Cl.³ F25B *13/00*
U.S. Cl. 165—2 **12 Claims**



1. A control circuit for air conditioning apparatus for providing heating and cooling to an area to be conditioned including a refrigeration system having indoor and outdoor heat exchangers, a compressor powered by a multispeed motor, and expansion means connected to form a refrigerant flow control circuit which comprises:

means for energizing the compressor motor at low speed,

means for energizing the compressor motor at high speed,

means for switching between the cooling mode of operation and the heating mode of operation,

a first temperature sensitive means in communication with the air in the enclosure, said first temperature sensitive means being connected in both the cooling mode and the heating mode to the means for energizing the compressor motor at low speed upon the temperature of the enclosure varying a first predetermined amount and to the means for energizing the compressor motor at high speed upon the temperature in the enclosure varying a second predetermined amount;

a second temperature sensitive means in communication with outdoor ambient air responsive only in the heating mode for energizing the means for actuating the compressor motor at high speed regardless of whether or not the temperature in the enclosure varied the second predetermined amount when the ambient air temperature is below a first predetermined level; and

defrost means for operating the refrigeration system in the cooling mode when a defrost need is sensed.

6. A method of controlling air conditioning apparatus supplying conditioned air to an enclosure, including a refrigeration system capable of being operated to provide either heating or cooling having a compressor powered by a multi-speed motor, an indoor heat exchanger, an outdoor heat exchanger, and expansion means which comprises the steps of:

sensing the temperature of the air in the enclosure;

energizing the compressor motor to provide heating in the first speed of operation when the temperature of the enclosure air falls below a first level;

energizing the compressor motor to provide heating at a second speed of operation when the temperature of the enclosure air falls below a second level;

sensing the temperature level of the outdoor ambient air; and

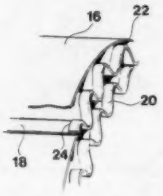
energizing the compressor motor to provide heating in a second speed of operation regardless of whether the indoor air has reached the second level when the outdoor air is below a first predetermined level.

4,228,847

CORE FOR USE IN HUMIDITY EXCHANGERS AND HEAT EXCHANGERS AND METHOD OF MAKING THE SAME

Sven Lindahl, Spanga, Sweden, assignor to Aktiebolaget Care Munters, Sollentuna, Sweden

Filed Feb. 13, 1979, Ser. No. 11,880
Claims priority, application Sweden, Feb. 16, 1978, 7801820
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—10 **6 Claims**



2. A core usable in humidity exchangers and heat exchangers comprising a laminate of alternate layers of flat and corrugated strip material, said layers cooperating to define a plurality of fine substantially parallel channels extending transversely through said laminate, said corrugated strip material being wider than said flat strip material and having reinforced edges and said flat strip material having a width no greater than the distance between the inner edges of the reinforced portions of the corrugated strip material.

4,228,848

LEAK DETECTION FOR COAXIAL HEAT EXCHANGE SYSTEM

George W. Wadkinson, Jr., Old Bethpage, N.Y., assignor to Grumman Energy Systems, Inc., Bohemia, N.Y.

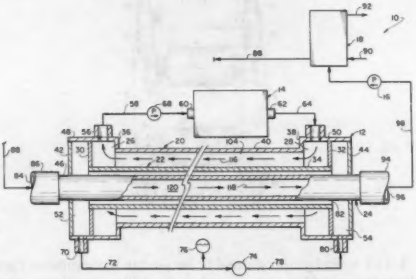
Filed Jan. 23, 1979, Ser. No. 5,804
Int. Cl.³ F28D *7/10*
U.S. Cl. 165—11 R **2 Claims**

1. In a heat exchange system:

a heat exchanger comprising at least outer, intermediate, and inner tubular members inserted one into the other and being in physical contact with one another, said outer and intermediate members having substantially longitudinally extending relieved areas in their bores that form outer and intermediate fluid passages therein, with the bore of said inner member forming a third fluid passage, the end portions of said outer tubular member having an expanded diameter with respect to the portion of said outer member intermediate said expanded end portions;

first coaxial end walls fixed at each end of said intermediate tubular member and extending transversely outwardly therefrom into a sealed relationship with the inside surface of said expanded diameter portions of said outer tubular member, second coaxial end walls spaced longitudinally outwardly of said first coaxial walls, said second walls being fixed to the outer surface of said inner tubular member and extending transversely outwardly therefrom into a sealed relationship with the inside surface of said expanded diameter portions of said outer tubular member, said end walls closing off said outer and intermediate longitudinal passages such that said fluid passages are isolated from one another and from said inner passage;

heat conducting means integrally formed in each of said tubular members, said means consisting of substantially longitudinally extending fins projecting radially inwardly, the fins of said outer member contacting the outer wall of



said intermediate member, the fins of said intermediate member contacting the outer wall of said inner member such that there is a metal-to-metal heat exchange relationship between said members, each fin of said members being spaced from its adjacent fins to thus form in said outer and intermediate members said longitudinal fluid passages; inlet and outlet ports opening on said passages in said members to permit the circulation of fluid therethrough;

detector means coupled to fluid in said intermediate passages to sense a condition of said intermediate fluid that signifies a leak in one of said tubular members; and

means for circulating fluid through said longitudinal passages of said outer member and through the bore of said inner member whereby heat is exchanged between the fluids.

4,228,849

APPARATUS FOR CONTROLLING RELATIVE GAS FLOW RATES THROUGH DUCTS

Reino Heinola, Kaarina, Finland, assignor to Valmet Oy, Finland

Filed Aug. 1, 1978, Ser. No. 929,951
Claims priority, application Finland, Aug. 12, 1977, 772437
Int. Cl.³ B60H *1/00*
U.S. Cl. 165—39 **4 Claims**

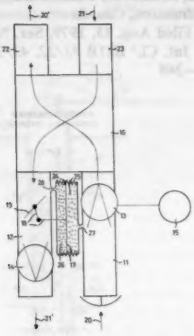
1. Apparatus for controlling the relative rates of flow of gases through a pair of ducts comprising:

a chamber defining a substantially enclosed interior; a partition member movably mounted within said chamber dividing the interior thereof into first and second partial volumes fluidly sealed with respect to each other;

first means for providing fluid communication with said first partial volume adapted to provide fluid communication between said first partial volume and a first duct in which a gas flows;

second means for providing fluid communication with said second partial volume adapted to provide fluid communication between said second partial volume and a second duct in which a gas flows; and

means associated with said partition member for transmitting the movement thereof exteriorly of said chamber adapted



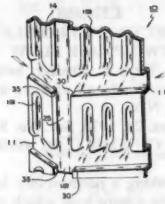
to control the extent of an opening of a damper located within one of said first and second ducts.

4,228,850

PLATE USED IN CONDENSER

Hiroyuki Sumitomo, Osaka, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan

Filed Jul. 25, 1978, Ser. No. 927,689
Claims priority, application Japan, Nov. 8, 1977, 52-134254
Int. Cl.[2] F28B *9/08*; F28D *9/00*; F28F *3/08*
U.S. Cl. 165—110 **1 Claim**



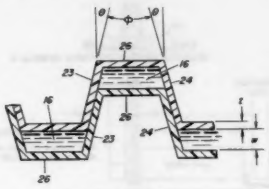
1. A plate for use in a condenser, said plate including condensate collecting and discharging elements, said condensate collecting and discharging elements comprising a plurality of V-shaped inclined grooves downwardly sloped towards a central portion of said plate, and a vertical groove formed along said central portion of said plate connecting with a lowest portion of each of said inclined grooves, wherein said inclined grooves form ramps leading to said vertical groove and said vertical groove forms a recessed channel, said condensate collecting and discharging elements further comprising a plurality of alternating longitudinal grooves and valleys, lower ends of said valleys opening towards said downwardly sloped inclined grooves, whereby said inclined grooves and said vertical groove minimizes the area of a filmy downflow liquid layer and prevents a film from growing too thick, thereby improving the heat transfer surface of said plate.

4,228,851

SOLAR HEATING PANEL

Robert L. LaBarge, Ben Avon, and Marvin H. Williams, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 12, 1977, Ser. No. 823,926
Int. Cl.[3] F28F *3/12*
U.S. Cl. 165—170 **2 Claims**



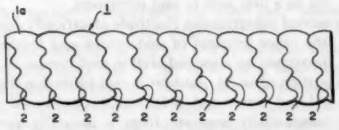
1. A heat exchanger comprising two corrugated sheet components joined together face-to-face to form a panel having multiple passageways therein between the components for flow of a fluid medium therethrough, each of said components being generally rectangular with parallel corrugations therein formed by diverging sidewall portions spaced by transverse wall portions between each sidewall portion, and with the sidewall portions of the opposing components joined together in with adhesive bonding parallel overlapping and contacting relation and the transverse walls of opposing panels spaced apart and forming passageways therebetween.

4,228,852

TUBULAR BODY

Akira Togashi, 14-31, 6-chome, Ryoke, Urawa-shi, Saitama-ken, Japan

Continuation of Ser. No. 776,215, Mar. 10, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 15,834
Int. Cl.[3] F28F *1/06*
U.S. Cl. 165—173 **19 Claims**

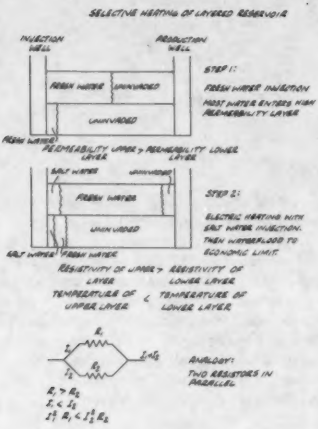


1. A tubular body comprising a series of periodically wavy recessed ribs formed on the external surface of the tubular body, said recessed ribs having a specific depth and a specific wave form about a base line at a center of the wave form, the base line being spirally formed at a specific lead angle to a plane containing the longitudinal axis of the tubular body; and a corresponding series of projecting ribs having the same specific wave form about the same base line formed on the internal surface of the tubular body; and the specific wave form being selected from a group of wave forms consisting of a sinusoid wave form, a saw tooth wave form, a wave form made of continuously connected alternating opposite semicircular curves, and a rectangular wave form.

4,228,853
PETROLEUM PRODUCTION METHOD

A. Herbert Harvey, and John P. Govier, both of Dept. of Mining, Petroleum and Geological Engineering, University of Missouri, Rolla, Mo. 65401

Filed Jun. 21, 1978, Ser. No. 917,730
Int. Cl.[2] E21B 43/22, 43/24
U.S. Cl. 166—248 31 Claims


SELECTIVE HEATING OF LAYERED RESERVOIR
INJECTION WELL
PRODUCTION WELL
STEP 1:
FRESH WATER
UNINVADED
FRESH WATER INJECTION
MOST WATER ENTERS HIGH PERMEABILITY LAYER
PERMEABILITY UPPER LAYER > PERMEABILITY LOWER LAYER
SALT WATER
STEP 2:
ELECTRIC HEATING WITH SALT WATER INJECTION. THEN WATERFLOOD TO ECONOMIC LIMIT
RESISTIVITY OF UPPER LAYER < RESISTIVITY OF LOWER LAYER
TEMPERATURE OF UPPER LAYER < TEMPERATURE OF LOWER LAYER
ANALOGY:
TWO RESISTORS IN PARALLEL

1. A method for facilitating recovery of oil from a crude oil reservoir by selective electrical resistance heating of a portion of the reservoir which would normally be substantially bypassed by fluid injected into the formation in which the reservoir is located, the method comprising the steps of:

establishing a series electrical circuit for passing current through the formation along a directed path differing from the naturally predominant path of injected fluid flow, said naturally predominant path being substantially occupied by high resitivity fluid, said circuit comprising:

a source of alternating current electric power,

a first subterranean electrode electrically connected to one terminal of said source and located in or in proximity to a first well in said formation,

a second subterranean electrode electrically connected to the other terminal of said source and located in or in proximity to a second well in said formation, and

a portion of an oil reservoir in said formation that contains oil and water and is located between said electrodes substantially separate from a naturally predominant path for flow of injected fluids from an injection well through said formation but affords a current path of lesser electrical resistance between said electrodes than that along said naturally predominant path or any alternative path through the formation that is entirely outside said portion;

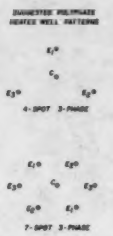
injecting a low resistivity liquid through an injection well into a region of said formation that forms a part of said circuit in series with said first electrode and said portion; and

passing alternating current from said power source through said circuit so as to cause selective electrical resistance heating of said portion, whereby the resistance to the flow of oil contained in said portion is reduced and oil is swept out of said portion by said low resistivity liquid.

4,228,854
ENHANCED OIL RECOVERY USING ELECTRICAL MEANS

Aleksy Sacuta, Edmonton, Canada, assignor to Alberta Research Council, Edmonton, Canada

Filed Aug. 13, 1979, Ser. No. 66,179
Int. Cl.[3] E21B 43/22, 43/24, 43/25
U.S. Cl. 166—248 4 Claims



1. In a process for recovering oil from an oil and water bearing formation wherein spaced injection and production wells penetrate the formation and a drive fluid is injected into the formation through the injection well and to assist in producing oil and some water through the production well,

the improvement comprising:

maintaining a unidirectional electrical potential gradient between anode means located in the production well and cathode means located in the injection well adjacent the formation, to retard water flow to the production well.

4. In a process for recovering oil from an oil and water bearing formation wherein at least two spaced wells penetrate the formation and there is a natural or induced drive energy within the formation sufficient for producing fluids.

the improvement comprising:

providing anode means in one well and cathode means in a second well and maintaining a unidirectional electrical potential gradient between the anode and cathode means; and

producing oil from the anode-equipped well.

4,228,855
METHOD OF INJECTIVITY PROFILE LOGGING FOR TWO PHASE FLOW

Alvin J. Sustek, Jr.; Terry L. Frazier, both of Houston, and Gregory Daryl, Woodlands, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 22, 1979, Ser. No. 51,074
Int. Cl.[2] E21B 47/00, 49/00
U.S. Cl. 166—250 11 Claims

1. A method of making a permeability log of a subsurface formation traversed by a bore hole which comprises:

(a) injecting a two phase fluid into the bore hole above said formation, said two phase fluid containing an effective amount of one radioactive substance which combines almost exclusively with only one phase of the injected two phase fluid;

(b) simultaneously injecting a similar two phase fluid which does not contain the radioactive substance into the bore hole below the formation;

(c) establishing a stable interface between the two fluids;

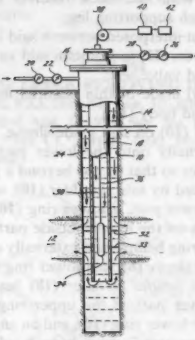
(d) determining the depth in the hole of said interface by measuring the radioactivity of the fluids throughout that portion of the hole being examined;

(e) then varying the ratio of the rates at which the two fluids are injected into the hole while maintaining the sum of the two rates as nearly constant as possible so as to cause said interface to move along the walls of the bore hole to another depth;

(f) determining the depth of the interface produced by the

change in injection rates in step (e) by the method of step (d);

(g) repeating steps (e) and (f) until a series of depth and injection rated measurements at the various interfaces



sufficient to adequately describe the formation is obtained for one phase of the injected two phase fluid; and

(h) repeating steps (a) through (g) with a second radioactive substance that combines almost exclusively with the other phase of the two phase fluid.

4,228,856

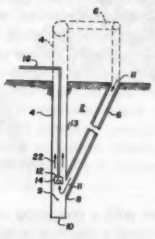
PROCESS FOR RECOVERING VISCOUS, COMBUSTIBLE MATERIAL

Lucio V. Reale, 1827 - 46th St. SE., Calgary, Alberta, Canada

Filed Feb. 26, 1979, Ser. No. 15,562

Int. Cl.[3] E21B *43/243*

U.S. Cl. 166—256 **22 Claims**



1. A process for recovering a viscous, combustible material from a sub-surface deposit of the material comprising:

forming a substantially vertical, main bore into the deposit;

igniting the deposit adjacent the base of the bore;

arranging a supply of air to the ignition site whereby a self-sustaining combustion takes place in the bore supported by natural draft generated by the combustion and the gaseous products of the combustion can leave the bore, and where the heat of the combustion and of the gaseous products of the combustion liquid melt the material in the deposit; and

extracting liquefied material from the bore.

4,228,857

FLOATING PLATFORM WELL PRODUCTION APPARATUS

Philippe C. Nobileau, Oxnard, Calif., assignor to Veteo Inc., Ventura, Calif.

Filed Dec. 11, 1978, Ser. No. 968,648

Int. Cl.[3] E21B *7/12*

U.S. Cl. 166—341 **12 Claims**

1. A cluster well production apparatus for floating platform production comprising: a central large diameter riser having a vertical axis, a plurality of wellheads surrounding the vertical axis of said central riser; a plurality of spiders fastened to said central riser at selected elevations, a plurality of guide funnels on each spider secured in spaced relationship with said central riser and in axial alignment with said wellheads; a production riser running directly upwardly from each wellhead and passing through corresponding guide funnels, said production riser including a tubing string; the openings through said guide funnels being significantly larger than said tubing string; and centralizers attached to said production riser at elevations corresponding to at least some of the spider elevations and sized to be in closely-spaced relationship within said funnels.

4,228,858

DRY SPRINKLER WITH NON-LOAD-TRANSMITTING SEALING ARRANGEMENT

Joseph R. Sclafani, Greenwich, Conn., assignor to The Reliable Automatic Sprinkler Co., Mount Vernon, N.Y.

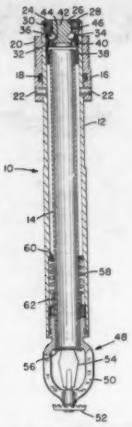
Filed May 1, 1978, Ser. No. 902,288

Int. Cl.[2] A62C *37/12*

U.S. Cl. 169—41 **23 Claims**

1. A dry sprinkler comprising an outer tube adapted for connection at one end to a fluid supply pipe in a fire protection system; an inlet member at said one end of the outer tube; a cap member at the other end of the outer tube; heat-responsive means normally holding the cap member in position at the other end of the outer tube but responsive to an elevated temperature condition to release the cap member therefrom; an inner member disposed in engagement with the cap member and within the outer tube for longitudinal movement relative thereto; said inlet member including means providing a fluid passageway at the end of the outer tube adapted for connection to the fluid supply pipe; sealing means slidably disposed in the fluid passageway for sealing the passageway and capable of passing the inner member when released from the fluid passageway; and seal retaining means responsive to the position of the inner member and cooperating with the sealing means for releasably retaining the sealing means in the passageway against fluid pressure in the fluid supply pipe when the inner member is disposed in one position in engagement with the cap member and permitting release of the sealing means from the passageway to permit ejection from the sprinkler when the cap member is released from the other end of the outer tube and the inner member is in a second position spaced from the sealing

means, the seal-retaining means including a plurality of locking members and means supporting the locking members for lateral motion toward and away from the sealing means, the inner member being spaced from the inlet member so as to permit



longitudinal motion of the inner member toward and away from the inlet member while the sealing means is retained by the seal-retaining means, thereby preventing transmittal of a load to the cap member by the inner member.

4,228,859

SPRINKLER HEAD HAVING A PLURALITY OF SUPPORTING LEGS

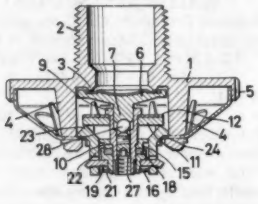
Tadashi Hattori, 15-20 1-chome, Kamori-cho, Kishiwada-shi, Osaka-fu, Japan

Filed Nov. 22, 1978, Ser. No. 963,021

Claims priority, application Japan, Jul. 31, 1978, 53-106867; Jul. 31, 1978, 53-106868

Int. Cl.³ A62C *37/08*

U.S. Cl. 169—57 **1 Claim**



1. A sprinkler head, comprising in combination:

(a) a discoidal body **(1)** with a lower part and a lower center;

(b) a water discharge valve seat **(3)** in said lower center;

(c) a plurality of supporting legs **(4)** formed in said lower part so as to be located on both sides of said valve seat **(3)**, said supporting legs having a hook receiver **(24)** inside the lower end of each supporting leg;

(d) a valve **(6)** having a lower center held in contact with said valve seat, a valve spindle **(7)** in said valve lower center, a guide sleeve **(8)** having an upper and lower end, said upper end being fitted into said valve spindle **(7)** from under, a pressure screw threaded into said guide sleeve **(8)**, and a valve ball **(28)** disposed so that said valve **(6)** is held in pressure contact with said valve seat with the interposition of said ball **(28)**;

(e) a flange **(9)** on the upper part of said guide sleeve **(8)**, an annular spring-guide **(11)** fitted externally around the guide sleeve **(8)**, outwardly extending lines **(22)** with engaging angles **(23)**, said angles having a top disposed to abut the lower part of the outer periphery of said spring-guide **(11)** and supported by said flange **(9)**, said levers having a lower element **(25)**, said engaging angles **(23)** being engaged with said hook receiver **(24)** inside the lower end of each supporting leg;

(f) a fusible element interposed between said lower elements **(25)** and said levers **(22)** to maintain said valve in pressure contact with said valve seat;

(g) a deflector **(29)** made of thin material mounted on the lower part of said body **(1)**.

and (h) a shoulder **(10)** on said guide sleeve, an upper ring **(15)** fitted externally onto the lower part of the guide sleeve from under so that its rise beyond a predetermined extent is precluded by said shoulder **(10)**, said upper ring **(15)** having a lower part, a lower ring **(16)** with a small diameter portion on the lower outside part of said lower ring, said lower ring being fitted externally onto the lower end of the guide sleeve **(8)**, said lower ring **(16)** having an upper part, said fusible member **(18)** being interposed between the lower part of the upper ring **(15)** and the upper part of the lower ring **(16)**, and an annular balancer **(19)** having a supporter formed on each side thereof, said annular balancer being

fitted externally onto said small diameter portion of the outside lower part of the lower ring **(16)** and being engaged with the engaging lower aperture **(25)** of said lever **(22)**.

4,228,860

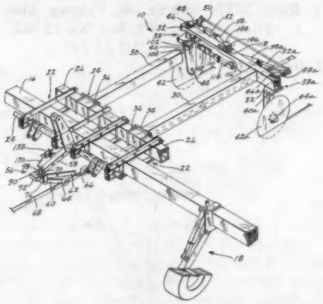
APPARATUS FOR SYNCHRONIZING THE STEERING DISC AND ROW FOLLOWER MEANS OF A ROW CROP IMPLEMENT

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed Sep. 29, 1978, Ser. No. 947,037

Int. Cl.³ A01B *69/06*

U.S. Cl. 172—26 **14 Claims**



1. In combination with a row crop implement including an elongated tool bar and a steering apparatus on the tool bar comprising a steerable coulter disc, a row follower means movable to a neutral position when the tool bar is transversely aligned relative to the crop rows, and a steering means for steering said coulter disc, in response to movement of the row follower means from said neutral position, said row follower means and coulter disc being disposed in synchronized relation when said row follower means is in said neutral position and said coulter disc is positioned for straight ahead movement of the implement, the improvement comprising,

first means for moving said row follower means to the neutral position therefor,

second means for disabling and enabling said steering means, and

third means for steerably positioning said coulter disc, while said steering means is disabled, for straight ahead movement of the implement whereby, with said row follower means moved to the neutral position therefor by said first means, said row follower means and coulter disc are disposed in synchronized relation upon enablement of said steering means.

4,228,861

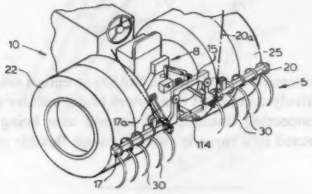
FOLDING TRACK REMOVING IMPLEMENT

Thomas E. Hart, P.O. Box 81, Lee, Ill. 60530

Filed Aug. 2, 1979, Ser. No. 63,103

Int. Cl.[3] A01B *73/00, 37/00*

U.S. Cl. 172—662 **23 Claims**



22. In a track removing farm implement with a U-shaped downwardly opening central frame member that has first and second elongated wing members extending laterally and essentially horizontally from first and second lower ends thereof, each said wing members has attached thereto a plurality of downwardly extending tines suitable for engaging and breaking up compacted earth, an improvement comprising:

rigid connection means,

first and second means for pivotably attaching the wing members to the frame interposed between the first and second wing members and the first and second lower ends of the central frame member, and

first and second means each for rotating one of said wing members, said first and second means for rotating each have a first and a second end, each said means for rotating is connected at said first end by a means for attaching to a respective one of said wing members, and at said second end to said rigid connection means,

said central frame member, said wing members, said connection means, said means for pivotably attaching, and said means for rotating so cooperating such that as the central frame member is moved in a first direction with respect to said rigid connection means, each said means for rotating causes the attached pivotably mounted one of said wing members to rotate upwardly from the essentially horizontal position to a non-horizontal position and as the central frame member is moved opposite said first direction with respect to said rigid connection means, each said means for rotating permits the attached pivotably mounted one of said wing members to rotate downwardly from the non-horizontal to the essentially horizontal position.

4,228,862

APPARATUS FOR DRILLING HOLES IN THE GROUND

Antoine Causse, 157, route de Blagnac, Toulouse (Haute-Garonne), France

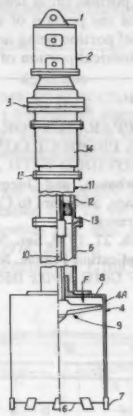
Filed Nov. 13, 1978, Ser. No. 959,852

Claims priority, application France, Nov. 15, 1977, 77 34246

Int. Cl.[2] E21B *9/20*

U.S. Cl. 175—242 **7 Claims**

1. Apparatus for drilling holes in the ground comprising a cylindrical drilling tool having an upper end and a lower end, a drilling edge being provided at the lower end of said drilling tool, a motor assembly for rotating said drilling tool, a rotatable elongate sleeve coupling said motor assembly to said drilling tool, said sleeve being interposed between the motor assembly and the drilling tool and being keyed to the upper end of said drilling tool, a hydraulic jack disposed for rotation with said sleeve, the hydraulic jack having a piston rod which extends through the upper end of the drilling tool into the



drilling tool said piston rod being longitudinally movable relative to said drilling tool, and means for closing and filling the drilling tool provided on the free end of said piston rod.

4,228,863

REAMER BIT FOR RAISE BORING

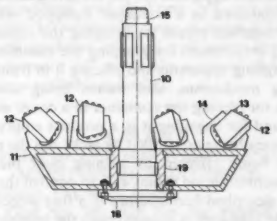
Bernt S. Liljekvist, and Anders E. Persson, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Sep. 5, 1978, Ser. No. 939,221

Claims priority, application Sweden, Sep. 9, 1977, 7710129

Int. Cl.[2] E21B *9/22*

U.S. Cl. 175—344 **7 Claims**



1. In a reamer bit for raise boring in rock, of the type comprising a body on which a number of rolling cutters with inserts are rotatably mounted for contact with and disintegration of the rock, and a detachable stem mounted in a central bore on the body and adapted to be received in a pilot hole drilled in advance in the rock, said stem having two cylindrical portions, an upper one of which having a smaller diameter than a lower one thereof, said bore in the body having corresponding upper and lower cylindrical portions surrounding the stem, the interface between said upper cylindrical portions of said body and said stem defining upper stem restraining surface means, and the interface between said lower cylindrical portions of said body and said stem defining lower stem restraining surface means, the improvement wherein the stem is provided with a flange located below said lower restraining surface means, said flange abutting the body from below and providing substantially all axial support for said body, means releasably connecting said flange to said body, said upper and lower restraining surface means together comprising a substantial

axial portion of that part of the stem surrounded by the bore, the corresponding surrounding portions of the bore in the body forming a close fit with the cylindrical portions of the stem, said upper and lower restraining surface means being separated by an annular relief portion on at least one of said stem and body, the diameter of the portion of said stem located at an upper end of said relief portion being no larger than the diameter of said upper cylindrical portion of said stem.

4,228,864

AUTOMATIC APPARATUS FOR WEIGHING AND EMPTYING A PRODUCT CONTAINED IN A CONTAINER PROVIDED WITH A COVER OR LID

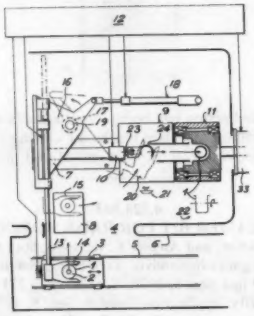
Guy F. Berger, Cherbourg, and Jacques Salom, Beaumont-Hague, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 27, 1979, Ser. No. 15,623

Claims priority, application France, Mar. 1, 1978, 78 05866

Int. Cl.[2] G01G *19/00*; B65B *21/02*

U.S. Cl. 177—145 **9 Claims**



1. An automatic apparatus for the weighing and emptying of a product contained in a container equipped with a cover, wherein it comprises means for bringing the container onto a manipulating area, means for grasping the container, bringing it onto a weighing apparatus and placing it in front of a cover manipulating mechanism, said means being controlled by jacks, means for placing the container in a cover manipulating mechanism and for engaging it in a product emptying mechanism, said means being controlled by jacks and the emptying of the product being effected by turning over the container, electrical synchronisation means able to control the means and mechanisms described hereinbefore in a first direction in such a way that the container is brought onto the manipulating area, grasped so as to bring it onto a weighing area, placed in the manipulating mechanisms so that the cover is removed, engaged in the product emptying mechanism, then so that the said means and mechanisms are controlled in a second direction opposite to the first direction in such a way that the container is disengaged from the emptying mechanism, is placed in the manipulating mechanism so that the cover is placed back on the container and so that the container is grasped and returned onto the weighing apparatus and then is returned to the manipulating area.

4,228,865

VEHICLE CONTROL SYSTEM FOR THE HANDICAPPED

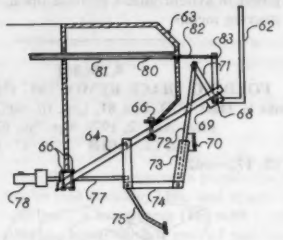
Robert J. Appley, 902 Birch Ave., Shelby, Mont. 59474

Division of Ser. No. 794,822, May 9, 1977, Pat. No. 4,143,281. This application Aug. 7, 1978, Ser. No. 931,613

Int. Cl.[3] B60K *26/00, 41/20*

U.S. Cl. 180—333 **4 Claims**

1. A dual function hand operated vehicle control system including a lever affixed to a rotatable shaft, two spaced arms extending generally upwardly from said shaft forward of said lever, one of said arms being pivotally connected to a substantially vertical push rod which extends downwardly into a substantially vertical sleeve, said push rod being capable of



effecting movement of said sleeve, the lower end of said sleeve being operatively connected to a power brake booster through pivotally connecting linkage, said second arm being operatively connected to a throttle cable through flexible connecting means.

4,228,866

HYDRAULIC POWER-STEERING SYSTEM

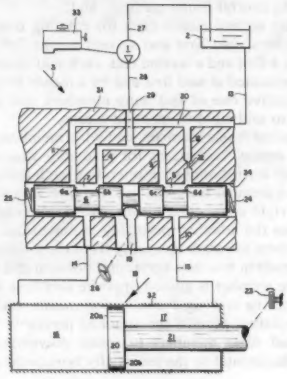
Fritz Naumann, Stammham, Fed. Rep. of Germany, assignor to Audi NSU Auto Union AG, Neckarsulm, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,992

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721414

Int. Cl.[2] B62D *5/06*

U.S. Cl. 180—132 **10 Claims**



1. A hydraulic power-steering system comprising:

a source of hydraulic liquid having a high-pressure side and a low-pressure side;

a power cylinder having a pair of chambers one of which is of larger effective surface area then the other;

control means having an input connected to said high-pressure side and having a pair of input branches, an output connected to said low-pressure side and having a pair of output branches, and a pair of control ports respectively connected to said chambers for displacement into one position wherein one of said input branches is connected to one of said control ports and one of said output branches is connected to the other control port and into a rest position wherein each input branch is connected to a

respective output branch and to a respective control port; and

a restriction in one of the branches connected to said other chamber in said rest position.

4,228,867

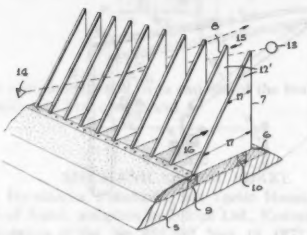
NOISE BARRIER

Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 742,404, Nov. 16, 1976, Pat. No. 4,175,639. This application Feb. 2, 1979, Ser. No. 8,817

Int. Cl.³ G10K *11/00;* **B64F** *1/26;* **E10F** *15/00*

U.S. Cl. 181—210 **8 Claims**



1. An acoustical barrier for interposition between a noise source and a noise receiver located within the acoustical shadow zone of the barrier, comprising:

a barrier member having an acoustically opaque base portion and having contiguous therewith an upwardly extending transition portion comprising a plurality of identical spaced apart elements contiguous with said base portion defining a plurality of flow ducts therebetween and each of such ducts having an effective path length which continuously decreases in said upwardly extending direction whereby the sound transmissibility between said elements follows a gradient and the sound transmitted between said elements tends to apply a phase opposition to the sound arriving at the noise receiver by refraction in the acoustical barrier through a region outside said shadow zone and thereby effectively redirect such refracted sound away from said noise receiver.

4,228,868

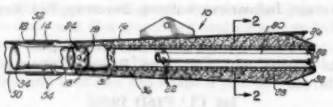
MUFFLER APPARATUS

Richard C. Raczuk, 19400 Singing Hills Dr., Northridge, Calif. 91324

Filed Jan. 8, 1979, Ser. No. 1,491

Int. Cl.³ F01N *1/10*

U.S. Cl. 181—247 **8 Claims**



1. A muffler having an entrance port and an exit port for being coupled to a source of noise having a gas passageway member through which gas flows, the muffler comprising:

a housing for being coupled at one of its ends to the gas passageway member;

a perforated tube attached to the interior of the housing for interiorly of the perforated tube a first straight unobstructed passageway through the housing; and

at least one solid non-perforated tube, each nonperforated tube opened at both of its ends for defining a second straight unobstructed passageway through the nonperforated tube, the non-perforated tube being positioned longitudinally in the first straight unobstructed passageway whereby the gas flows freely without substantial obstruction through both the first and second unobstructed passageways between the entrance and exit ports of the muffler.

4,228,869

VARIABLE VOLUME RESONATORS USING THE BELLEVILLE SPRING PRINCIPLE

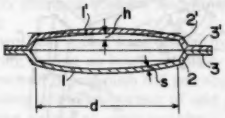
Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 812,617, Jul. 5, 1977, Pat. No. 4,149,612. This application Feb. 12, 1979, Ser. No. 11,778

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632290; Aug. 9, 1978, 2834823

Int. Cl.³ E04B *1/82;* **G10K** *11/10*

U.S. Cl. 181—286 **11 Claims**



1. A variable volume resonator for damping noise, comprising resonator wall means confining a volume which is at least partially evacuated; said wall means being constructed to form Belleville spring means, whereby said wall means have a small spring constant in response to reduced pressure loading relative to atmospheric pressure, said wall means comprising a central wall area, a peripheral wall area and shoulder means operatively located between the peripheral wall area and the central wall area of said wall means, said shoulder means connecting said central wall area to said peripheral wall area at least one of said wall means having a domed shape, said wall means having a given wall thickness "s", said domed shape having a height "h" within the range of about 0.5 to 5.0 times said given wall thickness "s", said wall means further having an effective diameter "d" within the range of about 30 to 300 times said given wall thickness "s".

4,228,870

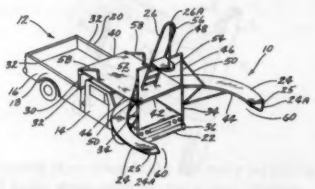
SCAFFOLD DEVICE FOR HARVESTING AND MAINTAINING FRUIT TREES

Paul F. Beardsley, Van Wert, Iowa

Filed Nov. 30, 1978, Ser. No. 965,029

Int. Cl.³ A01D *46/24*

U.S. Cl. 182—127 **5 Claims**



1. A scaffold device for picking and maintaining fruit trees, comprising,

a movable truck support means having forward and rearward ends and a longitudinal axis,

a single semi-circular catwalk defining an arc of substantially 180° fixedly mounted on said support means and having left and right hand portions oppositely and symmetrically

spaced with respect to the longitudinal axis of said support means,

said catwalk being mounted in an elevated position and extending forwardly beyond said support means so that said catwalk can be directed by the position of said support means to a position embracing a substantial portion of the circumference of a tree without interference of said support means with said tree.

4,228,871

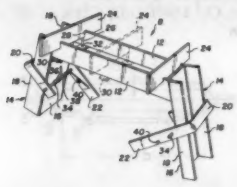
BRACKET

Leonard E. Koffski, Duncan, Canada, assignor to Talbot Industries, Ltd., Duncan, Canada

Filed Jun. 16, 1978, Ser. No. 916,143

Int. Cl.[2] F16M *11/00*

U.S. Cl. 182—184 **21 Claims**



1. A bracket for carrying a plank on support legs comprising:

(a) a cross piece of predetermined length for carrying said plank;

(b) a runner provided at each end of the cross piece having a surface defining a support leg pathway;

(c) a plurality of spaced fixed sleeves extending from each said runner around said pathway;

(d) a sleeve pivotally mounted on said runner and extending around said pathway, said pivotal sleeve having a portion for gripping support legs mounted in said pathway; and,

(e) a recess adjacent each end of said cross piece for receiving a cross bracing member extending perpendicularly between said bracket and another like bracket.

4,228,872

LADDER

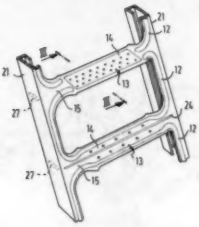
Gerd Treitz, Conollystr. 19, 8000 Müchen 40, Fed. Rep. of Germany

Filed Sep. 14, 1979, Ser. No. 75,581

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840266

Int. Cl.[3] E06C *1/38*

U.S. Cl. 182—194 **11 Claims**



1. A ladder comprising a pair of spaced-apart stiles, and a plurality of steps extending between said stiles, said stiles and steps being provided by a one-piece coherent metal sheet divided between the individual said steps, transversely to said stiles to define step bodies which are twisted out of the plane of said metal sheet to form said steps, each said twisted portion having a lesser depth than the step depth, and said stiles being formed by profiling of the flat sheet material, characterised by the provision, in the twisted regions between each said step and said stiles, of formations selected from corrugations and holes, and in that each said step body is stiffened by folding.

4,228,873

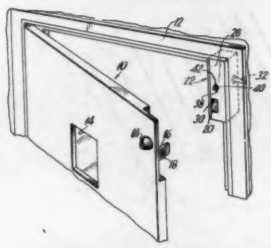
ELEVATOR DOOR SAFETY MECHANISM

George L. Nyborg, Jr., Bronxville, N.Y., assignor to Tri-County Elevator Co., Inc., Bronxville, N.Y.

Filed Nov. 2, 1978, Ser. No. 956,848

Int. Cl.[3] B66B *13/00*

U.S. Cl. 187—61 **7 Claims**



1. A safety mechanism for an elevator shaft door which is hingedly mounted to a door frame, comprising in combination:

latching means to latch said door to said door frame, said latching means including bolt means,

keeper means mounted on said door for engagement with said bolt means of said latching means,

said latching means including first and second latch releasing means to free said keeper means from said engagement to said bolt means to permit said door to open,

said first latch releasing means being operated by the presence of an elevator proximate to said door,

said second latch releasing means including a rod mounted therein, said rod being in engagement with said bolt means, said rod being manually operable to release said engagement of said keeper means by said bolt means,

an aperture in at least one of said door and said door frame to permit access to said second latch releasing means; and

lock means releaseably engageable with said aperture to seal said aperture when said lock means are in place and to permit access to said aperture when said lock means are removed.

4,228,874

ELECTROMAGNETIC BRAKE

Karl E. Brinkmann, Dörentrup, and Bernd L. Assmann, Barntrup, both of Fed. Rep. of Germany, assignors to K. Ernst Brinkmann, Industrieverwaltung, Barntrup, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,538

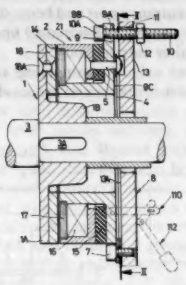
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747465

Int. Cl.[3] F16D *59/02*

U.S. Cl. 188—72.1 **14 Claims**

1. An electromagnetic device for braking a first member which is rotatable with respect to a stationary second member, particularly for braking a shaft which is rotatable with respect to a stationary part of a machine, comprising a magnetizable rotary first component fixedly secured to said first member; a second component adjacent to said first component; and means for non-rotatably coupling said second component to said second member with freedom of movement in the axial direction of said first component, said second component comprising a permanent magnet which attracts and axially displaces said second component to and into braking engagement with

said first component, and a solenoid energizable to establish an electromagnetic field tending to repel and axially displace said



second component away from and out of the braking engagement with said first component.

4,228,875

MECHANICAL DISC BRAKE

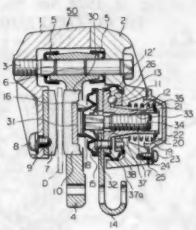
Tetsuo Haraikawa, Funabashi, and Tomio Hasaka, Kawasaki, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Continuation of Ser. No. 851,587, Nov. 14, 1977, abandoned. This application Aug. 21, 1979, Ser. No. 69,108

Claims priority, application Japan, Nov. 19, 1976, 51-155521[U]

Int. Cl.³ F16D *55/224*

U.S. Cl. 188—72.7 **5 Claims**



1. A mechanical disc brake for a vehicle, said brake comprising:

a stationary member adapted to be secured to a non-rotatable portion of a vehicle;

a caliper adapted to straddle a portion of the periphery of a rotatable disc and including first and second portions adapted to be positioned on opposite sides of the disc, said caliper being slidably supported by said stationary member for sliding movement in a direction parallel to an axis of the disc, said first portion of said caliper including an integral housing having an opening extending therethrough, said opening having a first end adapted to face the disc and a second end adapted to face away from the disc;

force converting means, mounted within said opening of said housing, for receiving a rotary input force, for converting said rotary input force into a linear output force, and for applying said linear output force to brake pads to cause such brake pads to be moved toward the disc, said force converting means comprising a rotatable member positioned within said opening of said housing and having extending therethrough a threaded passage, means, separate from said rotatable member, for rotating said rotatable member about an axis parallel to the axis of the disc, a separate ramp member fixed to said housing at a position adjacent said rotatable member, said rotatable member and said ramp member having facing inclined surfaces, at least one ball member positioned between said facing inclined surfaces, and a push rod extending through and in threaded engagement with said threaded passage through said rotatable member, said push rod having a first end adapted to engage a first brake pad, a polygonal cross-sectioned rotation retaining portion adjacent said first end of said push rod and a second end adjacent said second end of said opening in said housing, such that upon rotation of said rotatable member with respect to said ramp member, said facing inclined surfaces and said at least one ball member cooperate to impart said linear output force to said rotatable member and to said push rod;

a first dust cover positioned to close the space between said facing inclined surfaces and to cover said at least one ball member, said first dust cover having first and second opposite end portions, said first end portion being sealingly mounted on an outer circumference of said rotatable member, and said second end portion being resiliently mounted on an outer circumference of said ramp member and resiliently clamped between said ramp member and said housing;

a rotation control leaf spring fixed to said rotating means, said leaf spring having an inner periphery extending toward said first end of said push rod and resiliently engaging said rotation retaining portion of said push rod, and said leaf spring having an outer periphery; and

a second dust cover positioned to cover a space between said first end of said push rod and said rotating means and rotatable member, said second dust cover having first and second opposite end portions, said first end portion of said second dust cover sealingly surrounding said push rod at a position adjacent said first end thereof, and said second end portion of said second dust cover sealingly surrounding said outer periphery of said leaf spring.

4,228,876

INTERNAL SHOE DRUM BRAKES

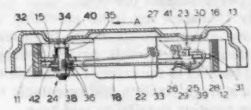
Duncan W. Osborne, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Feb. 26, 1979, Ser. No. 14,990

Claims priority, application United Kingdom, Feb. 28, 1978, 07835/78

Int. Cl.³ F16D *51/00*

U.S. Cl. 188—79.5 GT **7 Claims**



1. An internal shoe drum brake assembly including:

a pair of brake shoes each having a web thereon;

a strut acting between the shoes and having a variable overall effective length for automatic adjustment of clearance between the brake shoes and the brake drum when the brakes are released;

a first lost motion connection means whereby one end of the strut is connected to the web of one brake shoe and which provides a minimum clearance between the brake shoes and the drum;

and a de-adjusting means associated with said first lost motion means and whereby said minimum clearance can be increased,

and said de-adjusting means comprises a second lost motion connection having a greater clearance than said first connection means;

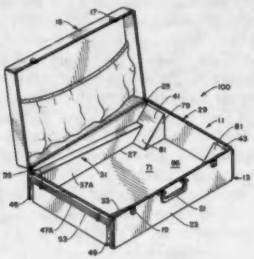
and a first spring acting perpendicularly to the web of the one brake shoe to bias the strut towards said web so that for normal service conditions the strut is connected to said one shoe by the first lost motion connection, and the bias of this spring must be overcome by manual operative means insertable through a hole defined in the drum brake assembly, during servicing of the brake, before the strut is connected to said one shoe by the de-adjusting means.

4,228,877

WHEELED SUITCASE WITH EXTENDABLE HANDLE MEANS

Walter G. Cothary, 178 Aileen Way, Grass Valley, Calif. 95945

Filed Dec. 26, 1978, Ser. No. 973,754
Int. Cl.[3] **A45C** *5/14, 13/22*
U.S. Cl. 190—18 A **18 Claims**



16. A traveling suitcase comprising a top section and a bottom section, said bottom section having upstanding opposed front and rear walls, and first and second opposed side walls, all normally intersecting and a base perpendicular to all of said walls, defining a storage area,

a pair of spaced openings in one of said side walls, one each near the junction of said side wall with said front and rear walls, each opening communicating with a compartment within said storage area,

an extendable U-shaped handle slidably disposed in said openings into the compartments,

means mounted within said storage area on said handle to prevent overextension thereof,

a generally U-shaped leg stand pivotably secured to said handle and extendable therewith from said storage area, and a releasably securable hinged wheelplate assembly disposed parallel to the exterior surface of said second side wall in a storage position and orientable therefrom to an operative position parallel to said base.

4,228,878

CONTROL DEVICE FOR CONTROLLING ACCELERATOR AND BRAKE SWITCHES

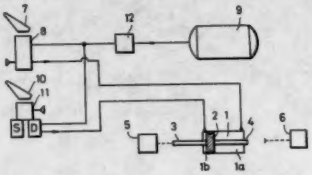
Nobuyuki Kisami, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,563
Claims priority, application Japan, Mar. 4, 1977, 52/25129[U]
Int. Cl.[2] **B60T** *17/00;* **F16D** *67/00*
U.S. Cl. 192—2 **3 Claims**

1. A control device for controlling accelerator and brake switches used for opening and closing electromagnetic contactors for an accelerator and brakes provided in a motor driving circuit of an electrically driven vehicle comprising:

mechanical bistable means having two entrance ports for bringing a displaceable member to one position upon introduction of air from one of said entrance ports, said displaceable member remaining in said one position notwithstanding subsequent interruption or reintroduction of air to said one entrance port and being displaced from said one position to another position only upon introduction of air from the other entrance port;

a first changeover valve for supplying air to said one entrance port upon depression of an accelerator pedal;



a second changeover valve for supplying air to said other entrance port upon depression of a brake pedal;

an accelerator switch disposed in a position in which it is turned on when said displaceable member of the bistable means is brought to said one position; and

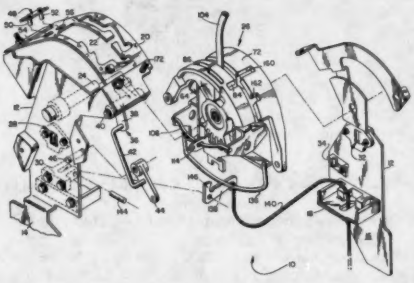
a brake switch disposed in a position in which it is turned on when said displaceable member is brought to the other position.

4,228,879

TRACTOR TRANSMISSION SHIFT CONTROL

Larry A. Woodbury, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 28, 1978, Ser. No. 946,498
Int. Cl.[3] **G05G** *5/10*
U.S. Cl. 192—4 A **30 Claims**



1. A shift control for a hydromechanical transmission comprising: support means having primary pivot means provided therein; range shift means pivotally mounted on said primary pivot means and connectible to a range change mechanism to shift said hydromechanical transmission between ranges upon pivotation of said range shift means, said range shift means having hold and shift means provided therein; speed shift means pivotally mounted on said primary pivot means and spaced apart from said range shift means, said speed shift means connectible to a speed change mechanism to shift said hydromechanical transmission between speeds upon pivotation of said speed shift means, said speed shift means having hold and shift means provided therein; main pivot means pivotally mounted on said primary pivot means and having secondary pivot means provided therein perpendicular to said primary pivot means; shift lever means carrying a shift lever and disposed between said range and speed shift means, said shift lever means pivotally mounted on said secondary pivot means

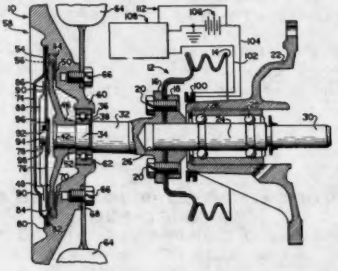
of said main pivot means for pivotation around said secondary pivot means to engage and disengage said shift means of said range and speed shift means and around said primary pivot means to selectively move or not move said range and speed shift means, said shift lever means including range engagement means cooperating with said support means to engage said hold means in said range shift means to hold said range shift means in a fixed pivoted position when said shift lever means is out of engagement with said shift means of said range shift means, said shift lever means including speed engagement means cooperating with said support means to engage said hold means in said speed shift means to hold said speed shift means in a fixed pivoted position when said shift lever means is out of engagement with said shift means of said speed shift means whereby said speed shift means is held when said range shift means is shifted, said range shift means is held when said speed shift means is shifted, and both are held when said shift lever means is not is a position to shift either.

4,228,880

PULSE CONTROL OF AN ELECTRO MAGNETICALLY ACTUATED VISCOUS FLUID COUPLING

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 25, 1978, Ser. No. 945,735
Int. Cl.[2] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **8 Claims**



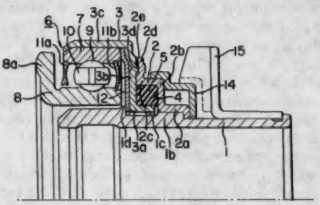
1. A viscous fluid coupling member comprising
a first member;
a second member rotatably disposed relative to said first member;
an operating chamber defined between said first and second members;
a fluid storage chamber adjacent said operating chamber;
fluid disposed within said storage chamber and movable into said operating chamber to provide in said operating chamber a medium to transmit rotational movement from one of said members to the other of said members;
pump means to move said fluid through a discharge opening from said operating chamber to said storage chamber to reduce said rotational movement;
inlet means to move said fluid through an inlet opening from said storage chamber to said operating chamber to increase said rotational movement;
a valve member movable in response to induction of a magnetic field from a first position to a second position, one of said positions allowing fluid movement between said chambers through one of said openings and the other of said positions blocking said fluid movement through said one opening;
means to bias said valve member to said first position; and
means for selectively inducing and terminating said magnetic field to pulse the movement of said valve member between said first and second positions to control the amount of rotational movement.

4,228,881

CLUTCH RELEASE DEVICE OF THE SELF-CENTERING TYPE USING A PLASTIC DEFORMATION MEMBER

Takeshi Nakamura, Hiratsuka, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1977, Ser. No. 829,575
Claims priority, application Japan, Sep. 14, 1976, 51-109451
Int. Cl.[2] F16D *23/14*; F16C *19/00*
U.S. Cl. 192—98 **19 Claims**



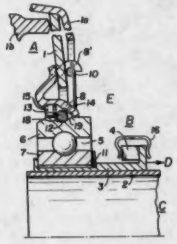
1. A clutch release device of the self-centering type comprising a clutch release bearing means for releasing a clutch, and bearing support means slidably mounted substantially coaxial with the rotational axis of the clutch for supporting and guiding said bearing means, said bearing means being formed for movement in a direction perpendicular to the rotational axis of the fly-wheel of said clutch, the improvement comprising:
a plastic deformation member of visco-elasticity disposed between said bearing means and said bearing support means;
said plastic deformation member being deformed by the motion of said bearing means perpendicular to said rotational axis which results from a centripetal force acting on said bearing means during clutch release when there is an eccentricity between said rotational axis of said fly-wheel and the center line of said bearing means, thus permitting movement of said bearing means to its centered position, so that said plastic deformation member is plastically deformed into said centered position and holds said bearing means at that position.

4,228,882

FRICTION CLUTCH UNIT

Lothar Huber, Bühl-Altschweier, and Werner Reitz, Ottersweier, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,109
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639766
Int. Cl.[2] F16D *23/14*
U.S. Cl. 192—98 **9 Claims**



1. In a friction clutch assembly for selectively connecting a motor and a transmission by rotationally locking them to one another and disconnecting them from one another through a disengaging system acting upon parts of a clutch and against

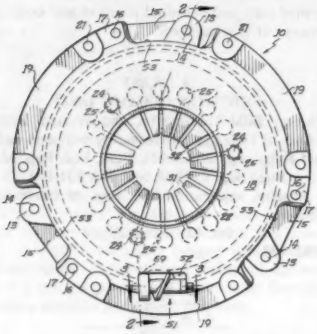
spring-biasing forces, the disengaging system including a guide member slidable along a guidance path located at the transmission side of the clutch assembly, disengaging means acting upon the guide member for sliding the same along the guidance path, antifriction bearing means having a bearing race connectible with the clutch at the motor side and a bearing race connected to the guide member at the transmission side, means for effecting the connection between the first-mentioned bearing race and parts of the clutch, at least part of the disengaging system being preassemblable, as a first sub-assembly, on the guidance path at the transmission side, the clutch being preassemblable as a second sub-assembly at the motor side, and a locking device including respective matching components lockable one with the other and carried by the first and second sub-assemblies, respectively, and means for effecting, during connection of the motor and the transmission, and at least in direction of disengagement, a force-locking connection between the preassembled first and second sub-assemblies, one of the matching components of the locking device comprising an annular detent formed in one of said first and second preassembled subassemblies and the other of the matching components of the locking device comprising at least one member having an annular configuration supportable by a conical section of the other of said first and second preassembled sub-assemblies and being spring-loadable in axial direction so as to project from the conical section toward said annular detent in radial direction, said member having said annular configuration being initially displaceable in radial as well as axial direction along said conical section until it is snappable into said annular detent so as to connect the bearing means to the clutch.

4,228,883

AUTOMATIC WEAR ADJUSTER FOR BELLEVILLE SPRING CLUTCHES

Albion W. Palmer, Birmingham, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 27, 1978, Ser. No. 900,452
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 A **12 Claims**



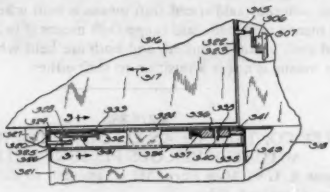
1. An automatic wear compensator for use in a diaphragm spring-actuated clutch assembly having a flywheel and a friction clutch disc with friction facings adapted for engagement by a pressure plate and subject to wear during use, a clutch cover, an annular pressure plate having a friction surface and a diaphragm spring pivotally mounted in said cover and adapted to urge the pressure plate into engagement, the wear compensator comprising a fulcrum ring on the pressure plate having a rearwardly extending annular flange providing a fulcrum edge cooperating with said diaphragm spring, said pressure plate having an annular recess receiving said fulcrum ring, camming means interposed between said pressure plate and said fulcrum ring to alter the distance between the pressure plate friction surface and the fulcrum edge upon relative rotation therebetween, and means sensing wear by sensing the extent of pivotal movement of the diaphragm spring comprising a peripheral tab on said diaphragm spring, a worm member operatively connected to the fulcrum ring, and an actuator drum actuating said worm member and having a recess receiving said spring tab.

4,228,884

WRAPPING APPARATUS

Charles E. Michels, Racine, Wis., assignor to Reliance Electric Company, Cleveland, Ohio

Division of Ser. No. 785,137, Apr. 6, 1977, Pat. No. 4,134,246.
This application Aug. 7, 1978, Ser. No. 931,645
Int. Cl.[2] F16P *3/08*
U.S. Cl. 192—135 **4 Claims**



1. Interlock mechanism for a wrapping machine having multiple guard covers, said mechanism comprising a switch, a switch actuator on one of said covers and interlock mechanism on the other said covers which will preclude said switch actuator from engaging said switch unless all such guard covers are closed,

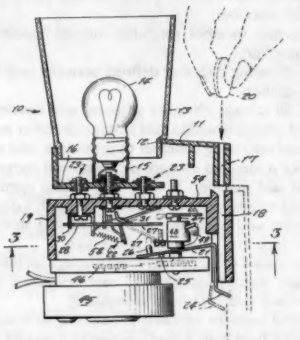
said interlock mechanism including a pin on one cover, a movable socket on a second cover and means on a third cover for moving said socket on the second cover to accept the pin on said one cover when all covers are closed.

4,228,885

COIN OPERATED ELECTRIC TIMER AUTOMATIC ELECTRIC CANDLE

Charles G. Cavalleri, 756 Third Ave., Brooklyn, N.Y. 11232

Filed Jan. 29, 1979, Ser. No. 7,593
Int. Cl.[3] G07F *15/12*
U.S. Cl. 194—9 T **6 Claims**



1. A coin operated electric timer, comprising in combination, an upper and a lower case secured together, a coin slot in said cases receiving a coin, a pivoted lever tripped by said coin, a pivoted arm carrying two contacts, being pivoted by said lever so as to contact a pair of stationary contacts connected to

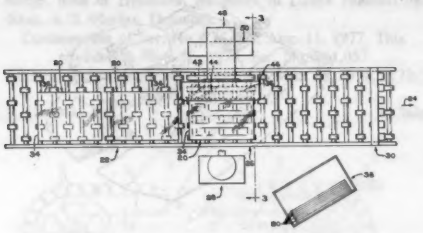
a socket fitted with a lamp bulb, and said arm contacts being connected to a power source plug.

4,228,886

POSITION SENSOR

Raymond D. Moran, Springdale, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 973,307
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—395 **13 Claims**



1. A method of determining orientation of an article having first and second sides, the sides having a fixed relationship to one another, comprising the steps of:

establishing at least two spaced energy fields having a fixed relationship with one another;

providing at least two detectors each having coordinates;

moving the energy fields and the article relative to one another to intersect one energy field by the first side and the other energy field by the first and second sides of the article;

determining by way of the detectors intersection coordinates of the energy fields; and

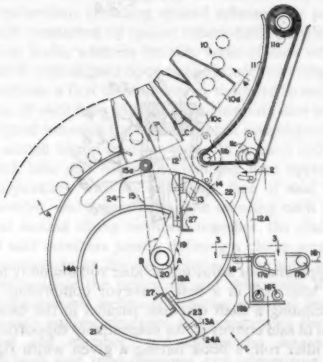
determining article orientation from the intersection coordinates and fixed relationship of the first and second sides of the article.

4,228,887

ROTARY BOTTLE DISCHARGE APPARATUS

Michael Vamvakas, Rocky River, Ohio, assignor to Niagara Bottle Washer Manufacturing Co., Cleveland, Ohio

Filed Mar. 19, 1979, Ser. No. 21,622
Int. Cl.³ B65G *29/00*
U.S. Cl. 198—408 **4 Claims**



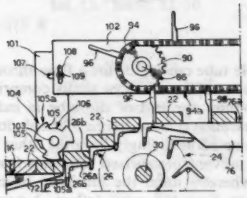
1. A bottle discharge apparatus using a carrier for empty bottles which provides plural linear rows of regularly spaced bottle receptacles moved by parallel link chains, one attached at each end of said row, said row of receptacles opening at a common face, said carrier moving in a path from a generally horizontal portion with all of said bottles lying on their sides to a generally vertical portion where said bottles are turned bottom downward nearly vertical with said common faces downward when said bottles reach a critical zone, means for holding said bottles in said receptacles up to said critical zone, means for receiving said bottles individually at said critical zone as they fall out of said receptacles, said receiving means timed relative to said carrier to cause said receiving means to be in position to accept each bottle as it slides out of its receptacle, a single fixed horizontal pad for each pair of associated bottle receptacles below and laterally outside of said critical zone, each receiving means having two portions, one portion curving laterally by an amount equal to one-half the spacing of associated bottle receptacles in one direction from said pad location up to said critical zone, the other portion of each receiving means curving laterally in the opposite direction by the same amount from said pad location up to said critical zone, said receiving means portions carrying said bottles independently to said single horizontal pad, and means at said pad to remove each bottle from its receiving means.

4,228,888

APPARATUS FOR FEEDING ARTICLES SUCH AS SWEETMEAT PRODUCTS TO A PACKAGING MACHINE

C. Ludovico Bruno, Oundle, England, assignor to Alisyncro S.a.S. di Bruno & C., Leini, Italy

Filed Nov. 9, 1978, Ser. No. 959,387
Claims priority, application Italy, Nov. 15, 1977, 69573 A/77; Aug. 8, 1978, 68873 A/78
Int. Cl.³ B65G *47/66, 47/88*
U.S. Cl. 198—461 **5 Claims**



1. Feeder apparatus for feeding articles such as sweetmeat products to a packaging machine, wherein the apparatus comprises in series:

a continuously driven feed conveyor belt arranged to receive at least one longitudinal row of articles from a production plant;

elevator means having shelves movable in the manner of an escalator continuously along a path which includes an ascending run and a decending run in the manner of an escalator, each shelf having a size corresponding to the size of the articles and having an upper comb-shaped support surface for the individual articles;

a fixed lower platform adjacent and coplanar with the delivery end of the feed conveyor belt;

an upper fixed platform, said lower and upper platforms having comb-like configurations staggered in relation to said comb-shaped support surfaces of the shelves so that the latter pass through said platforms, whereby each shelf in the ascending run of the elevator is displaced from a lower, loading, position in which it is coplanar with the lower platform to an upper, delivery, position in which it is coplanar with the upper platform;

ejecting means;

means operating the ejecting means in synchronism with the elevator, for removal of the articles as they are delivered to the upper platform;

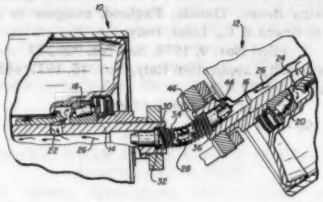
a fixed support structure;
an upper horizontal drive shaft supported by the support structure;
a frame articulated to the support structure for movement angularly about the axis of rotation of the drive shaft;
adjusting means for adjusting the angular position of said frame;
a lower horizontal shaft freely rotatably supported by the same frame, each of said upper and lower shafts supporting a pair of sprocket wheels around which pass two chains, and
support means carried by said chains and supporting respective said shelves of the elevator means in the ascending run of the latter.

4,228,889

LUBRICATION CONNECTOR FOR ROLLER CONVEYORS

Stephen N. Garrison, Anderson, S.C., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 23, 1979, Ser. No. 14,396
Int. Cl.³ B65G 45/02
U.S. Cl. 198—501 **10 Claims**



5. A flexible tube connector for a flow through lubricating system between adjacent hollow shafts comprising means for resiliently holding one end of the tube in indexed lubricant flow communication relative to one of the shafts, the other end of the tube adapted to slidingly fit in the other shaft and sized to generally prevent pressurized lubricant from leaking therebetween, whereby upon the lubricant having a predetermined pressure limit the tube deflects between said shafts causing said other end of the tube to slide outwardly in said other shaft, and means defining a lubricant leakage passage between said other end and said other shaft for allowing lubricant to escape from the tube and shaft before said other end of the tube is expelled by said pressure from the outer end of its cooperating shaft.

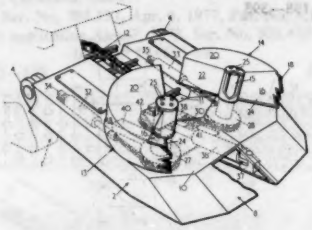
4,228,890

PARTICULATE MATERIAL LOADING EQUIPMENT

Miklos Tothfalusi, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 815,279, Jul. 13, 1977, abandoned. This application Feb. 27, 1979, Ser. No. 15,609
Claims priority, application United Kingdom, Jul. 13, 1976, 29037/76
Int. Cl.³ B65G 65/02
U.S. Cl. 198—514 **4 Claims**

1. A mining machine comprising a forwardly and downwardly inclined loading apron pivotally mounted at the front of the machine and a discharge conveyor extending from the loading apron towards the rear of the machine, the loading apron including a working deck for receiving particulate material to be loaded by the machine and a tapered leading margin for urging particulate material from a pile of particulate material towards the working deck, the loading apron having at least one driven paddle device for urging particulate material over at least a portion of the working deck towards the discharge conveyor, the driven paddle device comprising an angularly displaceable paddle mounted for repeated to and fro movement about a fixed pivotal axis along the portion of the working deck, and displacing means including hydraulic ram means for angularly displacing the paddle device about the fixed pivotal axis, the paddle device being shaped as a sector of a circle and having a working face for urging the particulate material, the working face extending from adjacent to the fixed pivotal axis of the paddle device towards a radially more remote peripheral face of the paddle device which, in use when the paddle device moves in a material urging direction, substantially extends along the full length of the path defined by the radially outer portion of the working face of the paddle device throughout angular displacement of the paddle device and a rear face which, when the working face of the paddle is not urging the particulate material, acts to guide particulate material onto the conveyor.

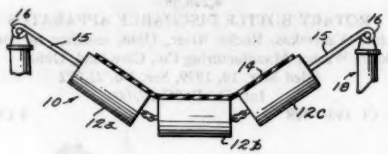


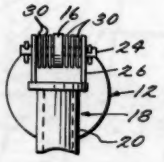
4,228,891

ADJUSTABLE IDLER ROLL

William Hanson, 428 N. Broadway, New Philadelphia, Ohio 44663

Filed Jan. 26, 1979, Ser. No. 6,648
Int. Cl.³ B65G 15/08, 39/16
U.S. Cl. 198—827 **4 Claims**





1. An apparatus for adjusting an idler roll assembly having at least one idler roll in a belt conveyor comprising: support means, including a shaft disposed parallel in the direction of movement of said conveyor, for suspendably supporting said at least one idler roll; a hook having a given width rigidly attached to at least one end of said idler assembly for hooking across said shaft; said support means having spacer means for securing said hook at any one of a plurality of positions on said shaft parallel to the direction of movement of said conveyor; said spacer means comprising a series of slidable disk elements having widths respectively less than said given width and holes

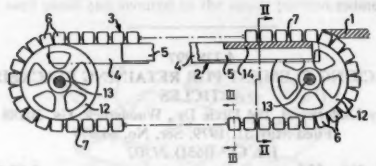
therethrough slidably mounted on said shaft in such number that said hook may be snugly hooked across said shaft between any adjacent two elements of said series of elements or at either end of said series of elements.

4,228,892

APPARATUS FOR THE STEPWISE ADVANCE OF MOULDS FORMED BY JUXTAPOSED IDENTICAL MOULD PARTS

Marius Gunnergaard, Lyngby, and Ole A. Jacobsen, Tisvildeleje, both of Denmark, assignors to Dansk Industri Syndikat, A/S, Herlev, Denmark

Continuation of Ser. No. 776,928, Aug. 11, 1977. This application Nov. 16, 1978, Ser. No. 961,057
Claims priority, application Denmark, Mar. 18, 1976, 1179/76
Int. Cl.³ B65G *23/00*
U.S. Cl. 198—832 5 Claims



1. An apparatus for the stepwise or intermittent advance of a plurality of objects which successively are provided to said apparatus, said apparatus defining the pathway for intermittently advancing the objects and comprising

a walking beam conveyor comprised of a plurality of sets of beams;

a pair of roller means respectively disposed at the opposite ends of and in alignment with said walking beam conveyor for rotation on axes disposed transversely of the pathway and with their upper peripheries substantially coplanar with the upper positions of said sets of beams;

and an endless, elongate belt type conveyor trained around said roller means and supported by said sets of beams at the coplanar upper positions of said sets of beams, whereby the objects are supported and intermittently advanced by said belt type conveyor, said belt type conveyor comprising a plurality of transversely disposed, rigid rod members for supporting the objects, said rod member constituted by a tube of substantially rectangular cross-section including spaced substantially parallel side walls connected by spaced substantially parallel inner and outer walls, wherein the side walls of each tube are provided with aligned openings adjacent their respective end portions, a first clamp member mounted in each end portion of each tube and having a clamping face substantially aligned between the inner edges of said aligned openings, a second clamp member mounted in each end portion of each tube and having a clamping face opposite to and cooperative with the clamping face of said first clamp member, and means releasable securing each of said first and second clamp members together, the clamping faces of said members jointly defining a clamp area extending transversely of the end portion of the tube substantially intermediate the height of said side walls, and flexible, non-extensible means connecting said rod members as a unitary endless structure and maintaining the spacing of said rod member, said connecting means extending through said tube openings and comprising strand like members which are secured to the said tubes in said clamp area to constitute an endless conveyor trained around said rollers and surrounding said walking beam conveyor with said inner walls engaging said rollers and being supported by said walking beam conveyor.

4,228,893

INHIBITION OF PAINT-PRODUCT SKIN FORMATION ON THE INTERIOR SURFACE OF A PAINT VESSEL LID

Kenneth Franklin, Pittsburgh; William S. Rosenthal, Monroeville, and S. Thomas Greer, McMurray, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 2, 1979, Ser. No. 25,710
Int. Cl.³ B65D *81/24*
U.S. Cl. 206—205 17 Claims

1. A method to inhibit the formation of a paint-product skin on the interior surface of the lid of a closed upright vessel housing a paint composition wherein a portion of said composition is volatile, the method comprising:

a. delivering said paint composition to an upright open vessel closeable at its top with a lid;

b. delivering a sufficient quantity of a barrier material to the open vessel to provide a covering layer of the barrier material for the top of the paint composition, said barrier material being characterized as

1. less dense than the paint composition:

2. containing a volatile portion whose volatility is at least substantially equivalent to the volatility of the volatile portion of the paint composition;

3. sufficiently compatible with the paint composition to produce no detrimental effects therein and to become a mixed non-detrimental component thereof upon adequate mixing therewith; and

4. more viscous than the paint composition; and

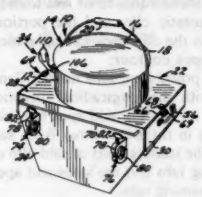
c. closing the open vessel at its top with a lid.

4,228,894

COMBINATION FISHING CREEL AND SEAT

George C. Lyles, 1075 Hoffman Ave., Long Beach, Calif. 90813

Filed Mar. 2, 1979, Ser. No. 17,063
Int. Cl.³ B65D *85/50*
U.S. Cl. 206—315 R 5 Claims



1. A portable fishing seat combination comprising an upright cylindrical bucket having a removable padded lid which includes a flat positioning disk located on its underside and which rests upon the mouth of the bucket, a cabinet affixed externally to said bucket at a location below said lid and extending laterally therefrom and having side walls and a flat upper surface with a screw cap mounting thereon for supporting a fishing pole thereon, and said side walls extend downwardly from said flat upper surface on opposite sides of said bucket to the level of the bottom of said bucket, and said cabinet encloses a pair of diametrically opposed laterally reciprocal tackle drawers mounted in said cabinet and externally of said upright bucket, and the inner ends of said drawers are configured to the contour of the sides of said bucket and seat snugly thereagainst, a carrying handle fastened to the sides of said bucket between said padded lid and said cabinet, a towel bar mounted horizontally on one of said side walls of said cabinet and a fishing pole rack mounted on the same side wall of said cabinet below said towel bar for carrying a fishing pole horizontally, a pole support having means for holding a fishing rod in inclined disposition affixed atop said flat upper surface and is removably engageable in said screw cap mounting on said flat upper cabinet surface, said pole support having means for slidingly adjusting the degree of inclination of said fishing pole, and a creel removably positionable in said bucket with

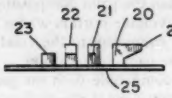
said padded lid in position on said bucket, said creel having a solid, cylindrical concave bottom pan portion and open wire mesh walls extending upwardly from said pan and includes a closable lid, whereby said bottom pan retains a minimum water level in said creel and said wire mesh walls and said closeable creel lid provide a restraining enclosure for solid objects in said creel while allowing water to flow out of said creel down to said minimum water level of said concave bottom pan.

4,228,895

MAGAZINE TAPE CONTAINING A PLURALITY OF HEMOSTATIC CLIPS

Joseph F. Larkin, Holland, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1979, Ser. No. 26,253
Int. Cl.³ B65D *85/24*
U.S. Cl. 206—339 **6 Claims**



1. A magazine tape for containing a plurality of hemostatic clips comprising:

a flat flexible belt;

a plurality of units attached to said belt, each unit containing a hemostatic clip and each unit consisting of in succession a parallel aligned pair of:

leading tabs;

side retaining tabs and apex retaining tabs said retaining tabs containing a groove adjacent the sides of said belt having a height about equal to the thickness of said clip and a thickness about equal to or less than th width of one side of a hemostatic clip, and the portion of said apex tabs adjacent to the clip apex having a contour about equal to said clip apex contour;

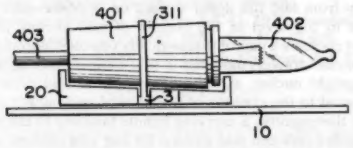
feeding and positioning tabs having flanged upper portions parallel with the longitudinal direction of said belt and extending away from said apex tabs, said flanged portions decreasing in thickness away from said positioning tabs, whereby the leading ends of said clip can be contained on said leading tabs and the sides and apex can be contained on said retaining tabs.

4,228,896

PACKING DEVICE FOR DECORATIVE STRING SET

Jeng-Shyong Wu, No. 133 Tungshing Rd., Toufun, Maulii, Taiwan

Filed Mar. 15, 1979, Ser. No. 20,702
Int. Cl.³ B65D *85/42*
U.S. Cl. 206—420 **11 Claims**



1. A packing device for a decorative light string set having a plurality of sockets with bulbs therein comprising:

a base member carried on a protective card, said base member having a front and a rear raised stand formed respectively at opposite ends thereof and defining a recess for receiving the bulbs and sockets of the decorative light string set to be packed, with the front and the rear ends of each bulb and socket in alignment with said front and said rear raised stands, said base member having a plurality of through-openings in said recess, spaced along a direction transverse to a longitudinal axis of the bulbs and sockets when they are received in said recess;

a fastener member having a lengthwise seat and a number of spaced, upwardly-extending claw elements formed on and integrally with the seat, said fastener member fitted into a position in which said claw elements each extend up through a corresponding through-opening of said base member from a bottom side of said recess so that any two adjacent claw elements can grip, between them, one bulb and socket in said recess intermediately of said front and rear stands and hold the bulb and socket firmly against an upper surface of said base member; and

an upper surface of said seat of said fastener member and a lower surface of said base member being provided with interengagement means so that said fastener member when in its fitted position, is firmly attached to said base member.

4,228,897

STACKING ELEMENT FOR RETAINING STACKED ARTICLES

J. Larry Underwood, 104 Dixie Dr., Woodstock, Ga. 30188

Filed May 31, 1979, Ser. No. 44,077
Int. Cl.³ B65D *21/02*
U.S. Cl. 206—504 **7 Claims**

1. A molded plastic stacking element for assembling a plurality of similar articles vertically and laterally in a stack in a plurality of tiers with the articles in each tier laterally adjacent, said stacking element having a closed, peripheral configuration with a radial projection in a plane on its inner periphery to be interposed between two vertically adjacent articles and upper and lower rib formations on said closed configuration for laterally engaging rims on lower and upper ends of said vertically adjacent articles, said element having a series of spaced, solid lateral projections in said plane of said radial projection and extending laterally outwardly from its outer periphery a distance at least as great as the width of a projection and spaced by complementary spaces corresponding to said lateral projections in size and shape to receive and laterally engage similar projections on a laterally adjacent stacking element so that a plurality of said projections on adjacent elements will interengage in substantially any relative positions of said elements.

4,228,898

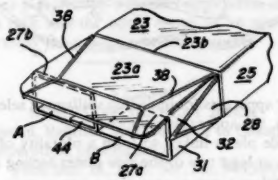
RECLOSABLE CARTON AND BLANK THEREFOR

Charles R. Zeitter, and John F. Thomas, both of Grand Rapids, Mich., assignors to Packaging Corporation of America, Evanston, Ill.

Filed May 14, 1979, Ser. No. 38,656
Int. Cl.³ B65D *5/74, 5/54*
U.S. Cl. 206—621 **5 Claims**

1. A reclosable folding carton formed from a single blank of sheet material and having an interior formed into a pair of

upright contiguous relatively isolated compartments, said carton comprising a closed bottom; substantially wide wall panels foldably connected thereto and having upper sections disposed in substantially convergent relation and forming a closed narrow elongated transversely extending top; narrow side panels foldably connected to corresponding side edges of said wall panels, each side panel being provided with an upper section including a center segment having tapered side edges and a pair of gusset segments each foldably connecting a side edge of the center segment to an adjacent side edge of the upper section of a wall panel, the upper edge portions of said pair of gusset segments initially being in face-to-face non-adhered relation and sandwiched between corresponding portions of the wall panel upper sections to initially form a closed leakproof top for said carton, the center segments of said panels being in substantially convergent relation when said carton top is closed; and elongated top closure flap connected by a foldline to the upper edge of one wall panel, said top closure flap being substantially coextensive with the upper edge of said one wall panel and secured to the upper portion of the other



wall panel and concealing the upper edge portions of said other wall panel and said side panels, said foldline having at least one weakened end portion aligned with the upper edge portions of a pair of said gusset segments when the top of the carton is initially closed; and a partition foldably connected to one panel and disposed within the carton interior and having an elongated portion having a length substantially coextensive with the height of said wall panels, said portion extending between said wall panels and separating the carton interior into said contiguous isolated compartments, said partition portion having a foldable upper section of substantially the same configuration as the upper section of a side panel and being sandwiched between and sealingly secured to the convergent upper sections of said wall panels; the weakened end portion of said foldline being adapted to be torn and expose the upper edges of the gusset segments aligned therewith whereby said gusset segments are adapted to be manually folded outwardly relative to one another and coact with the adjacent center segment and form a pouring spout communicating with a selected one of said compartments.

4,228,899

CONTAINER WITH A DISPENSING ORIFICE AND BLANK THEREFOR

John J. Austin, Jr., Hinsdale, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 26, 1979, Ser. No. 15,069

Int. Cl.³ B65D 5/72

U.S. Cl. 206—626 **29 Claims**

1. A container having a dispensing orifice comprising:

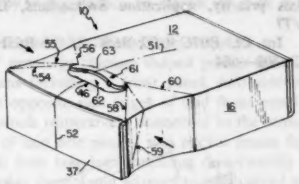
a front panel, right and left side panels and a rear panel hingedly connected along parallel fold lines to form an enclosed chamber;

a glue flap interconnecting said rear panel and one of said side panels;

a bottom closure connected to the bottom of said panels to close the chamber at the bottom;

a top closure connected to the top of said panels to close the chamber at the top; and

means defining a dispensing flap in said front panel, said means including a frangible perforated line defining a dispensing orifice, said means further including two sets of a plurality of fold lines formed in said front panel, each set contacting said perforated line at opposed ends and extending from such contact to opposite sides of said front panel with one of said fold lines in each said set extending onto the adjacent side panel,



whereby, once said dispensing flap is manipulated to fully sever the perforated line and form the dispensing orifice, pressure applied to said side panels causes said dispensing flap to extend outwardly from said front panel and away from said chamber to expand said dispensing orifice for the pouring out of the contents of said enclosed chamber.

4,228,900

PACKING OF THE FOLDING BAG TYPE, PRIMARILY FOR PIPE TOBACCO, AND A FOLDING BAG MEMBER FOR SUCH A PACKING

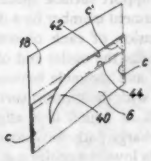
Heinrich W. Lambach, and Leif Sörensen, both of Horsens, Denmark, assignors to Brdr. Schur International A/S J. W. Schursvej, Denmark

Filed Sep. 18, 1978, Ser. No. 943,125

Claims priority, application United Kingdom, Sep. 16, 1977, 38789/77

Int. Cl.³ A24F 23/02

U.S. Cl. 206—260 **2 Claims**



1. A packing of the folding bag type, particularly for pipe tobacco, comprising a bag portion formed by two opposed front and rear wall portions of plastic sheet material which are permanently joined along a bottom edge and two side edges, while along an upper mouth edge they are joined in a sealed, yet releasable manner, the rear wall portion being extended upwardly forming a folding flap portion which, when the packing is folded together, is laid against the outside of said bag portion, characterized in that the mouth edge is closed by means of a sheet strip member laid over and along the mouth edge and welded to the outside of the front wall portion and the inside of the folding flap portion, respectively, at least one of these welds being of a breakable or releasable type, in which the sheet strip member consists of a sheet material different from the bag sheet material and is additionally welded releasably to the bag portion adjacent the side edges of the bag portion by end weld lines extending up to the welding line area between the strip member and the folding flap portion, in which said end weld lines at least at one end of the strip member extend upwardly and inwardly to form an easily seizable end portion of the strip member.

4,228,901

SEPARATOR DEVICE FOR ELONGATE OBJECTS ADVANCING ALONG A CONVEYING PATH

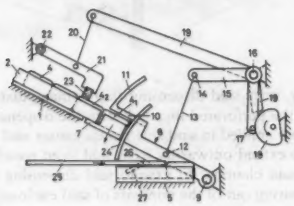
Roland Watzka, Feuerthalen, and Henri Bartholme, Neuhausen am Rheinfall, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 22, 1978, Ser. No. 972,369

Claims priority, application Switzerland, Dec. 29, 1977, 16207/77

Int. Cl.[3] B07C 9/00; B65G 25/04; B65H 5/00

U.S. Cl. 209—684 6 Claims



1. A separator device arranged to be disposed in a conveying path for elongate objects each having a desired length, said device comprising means defining an inclined input path presenting at least one channel presenting an object support surface along which a succession of such objects slide downwardly in the direction of their longitudinal dimension; a fixed abutment member disposed downstream of, and in line with, said input path for limiting the movement of an object exiting from said channel; means defining a discharge path for discharging objects in succession from said device, said discharge path presenting an object support surface spaced below the lower extremity of said abutment member by a distance at least equal to the vertical dimension of each object; a pivotally movable plate located between the outlet end of said channel and said abutment member and movable between a raised position in which it is aligned with the support surface of said channel and a lowered position in which it is aligned with the support surface of said discharge path, movement of said movable plate from its raised to its lowered position acting to cause an object located between the outlet end of said channel and said abutment member to move downwardly while sliding along said abutment member into alignment with said discharge path; a pusher member movable for pushing an object which is thus aligned with said discharge path beneath said abutment member and onto said discharge path; a clamping strip movable between a retracted position in which it permits downward sliding movement of objects along said channel and a clamping position in which it blocks such movement, said strip being located relative to the outlet end of said channel such that, when an object having the desired length is positioned against said abutment member, and when said strip is in its clamping position, said strip will clamp the next following object if it has the desired length but not if it has less than the desired length; clamping control means connected to said strip to move it from its retracted position to its clamping position at the start of movement of said movable plate from its raised position to its lowered position in order to permit a next following object having less than the desired length to exit from said channel; and a movable member disposed for separating from the conveying path an object which has exited from said channel after the start of movement of said movable plate from its raised position to its lowered position.

4,228,902

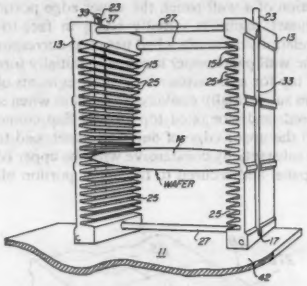
CARRIER FOR SEMICONDUCTIVE WAFERS

Harvey L. Schulte, Los Altos, Calif., assignor to Kasper Instruments, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 848,921, Nov. 7, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,368

Int. Cl.[2] B23P 17/00; A47G 19/02

U.S. Cl. 211—41 20 Claims



1. A carrier apparatus for impeding spillage of selected items stored therein, the apparatus comprising:

a pair of side plates linked to form a plurality of transport channels, at least one of the side plates having a recessed region; and

a stop member pivotally mounted in the recessed region for automatic movement between an inoperative position out of the transport channels to permit pasage of the items therethrough in response to the apparatus being set down, and an operative position protruding into the transport channels and blocking passage of the items therethrough to impede spillage of the items in response to the apparatus being picked up.

4,228,903

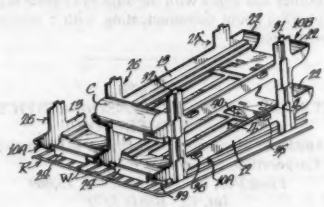
GRAVITY FEED CAN DISPENSER FOR BEVERAGE COOLERS

Ronald P. Eckert, Northbrook, Ill., assignor to Thomas A. Schutz Co., Inc., Morton Grove, Ill.

Filed Apr. 26, 1979, Ser. No. 33,721

Int. Cl.[3] A47F 5/01; B65G 11/00

U.S. Cl. 211—49 D 14 Claims



1. A stackable gravity feed can dispenser for a cooler which has racks formed of parallel wires extending from front to rear of the cooler, said dispenser comprising, in combination:

a downwardly and forwardly inclined guideway to support a series of cans for seriatim rolling movement from a filling end of the guideway at the rear of the cooler to a delivery end at the front of the cooler;

side walls defining the sides of the guideway, said side walls having integral upright supporting webs near the rear and the front which are thinner than the space between wires of a cooler rack, said webs having upper ends above the plane of the guideway which have upper interengaging

means and lower ends below the plane of the guideway which have lower inter-engaging means complementary to said upper inter-engaging means, whereby two of said dispensers may be stacked with the webs of the upper of said two dispensers seated on the webs of the lower of said two dispensers and with said upper and lower means inter-engaged, and said webs leaving an unobstructed space for cans in the lower dispenser;

a depending, transversely elongated rack-engaging foot adjacent the front of the guideway, said foot being adapted to rest upon several of the rack wires to support the front of a lowermost dispenser stably on the rack and being vertically short enough to avoid interference with removal of cans when a dispenser is the upper of two dispensers;

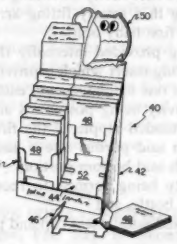
and hinged panel means near the rear of the guideway, said panel means having a non-interference position entirely outside said unobstructed space and having a supporting position with a surface effectively coplanar with the lower ends of the supporting webs, said panel means having a transverse dimension greater than the span across several rack wires, whereby said panel means of a lowermost dispenser may occupy a supporting position resting stably upon a rack and the panel means of an upper dispenser may occupy the non-interference position.

4,228,904

STAIRSTEP DISPLAY RACK

Vernon Dumond, Redfield, Ark., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 18, 1978, Ser. No. 943,046
Int. Cl.[2] A47F 7/00; B65D 5/50
U.S. Cl. 211—55 **11 Claims**



1. A stairstep display rack for displaying items in a stairstep arrangement on a horizontal surface comprising:

an outer casing;

a support member adapted to be mounted within said casing; said member having a generally planar support panel, means for supporting said support panel so that it is inclined relative to the horizontal surface and exposed in said casing when said member is mounted in said casing, and a plurality of aligned slots in said support panel;

at least one generally channel shaped pocket means for receiving a quantity of items to be displayed; said pocket means including a front panel, two side panels attached to opposite side edges of said front panel and two back panels respectively connected to the remaining side edges of said side panels, said pocket means further including at least two legs extending downwardly from the lower edge thereof and adapted to be received in said aligned slots, and wherein the lower edges of said side panels are inclined upwardly towards said back panels, with the angle of inclination of the lower edges of said side panels being equal to the angle of inclination of said support panel such that the lower edges of said side panels rest against the upper surface of said support panel thereby maintaining said pocket means in a vertical orientation; and

said casing, support member and pocket means each being in the form of a flat, planar sheet of material which may be folded to its assembled configuration;

whereby said casing, support member and pocket means may be stored and shipped in a flat configuration, and assembled easily on location without any preassembly.

11. A stairstep display rack comprising

a generally planar support panel;

means for supporting said support panel at an angle relative to a generally planar surface on which the rack is to be mounted;

a plurality of aligned slots in said support panel;

a plurality of generally channel shaped pocket means said pocket means including a front panel, two side panels attached to opposite side edges of said front panel, and two back panels respectively connected to the remaining side edges of said side panels, said pocket means further including at least two legs extending downwardly from the lower edge thereof and adapted to be received in said aligned slots, and wherein the lower edges of said side panels are inclined upwardly towards said back panels, with the angle of inclination of the lower edges of said side panels being equal to the angle of inclination of said support panel such that the lower edges of said side panels rest against the upper surface of said support panel to maintain said pocket means in a vertical orientation;

at least some of said pocket means arranged in a line extending up the incline of said support panel;

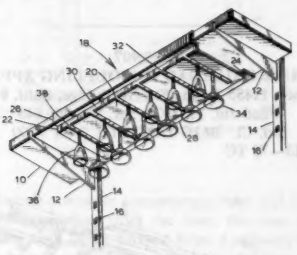
whereby said pocket means are arranged in a stairstep manner.

4,228,905

STEMWARE SHELF BRACKET

David F. Cammarota, 59 Franklin St., Northport, N.Y. 11768

Filed Nov. 29, 1978, Ser. No. 964,495
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—71 **1 Claim**



1. A shelf bracket for hanging inverted stemware having a narrow stem connected to a wide base, comprising

a flat horizontal rack having front and rear upstanding flanges connected to inwardly opening, elongated channels offset outwardly from said flanges and adapted to snugly fit the front and rear outer edge portions of a shelf on which the rack is mounted with said flanges depending from the lower inner edges of said channels in inwardly spaced relation to the front and rear edges of said shelf to insure stability of said bracket on the shelf,

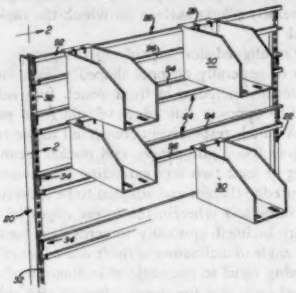
said front flange having a plurality of wide openings for the passage of an inverted stemware base, and a narrow slot extending rearwardly from the center of each such wide opening for the passage of the stem of said inverted stemware.

4,228,906

ADJUSTABLE RAIL MOUNTING ASSEMBLY

Dennis L. Jones, Bakersfield, Calif., assignor to Kardex Systems, Inc., Marietta, Ohio

Filed Sep. 14, 1978, Ser. No. 942,911
Int. Cl.[3] A47F 5/00
U.S. Cl. 211—126 10 Claims



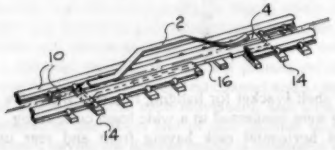
1. An adjustable mounting assembly comprising, in combination, a slotted upright support post, a slotted, substantially horizontal mounting rail for attachment to said post and support of storage containers thereon, and attaching means for removably securing said mounting rail to said post, said attaching means comprising an adjustable locking bracket for insertion through said slotted mounting rail and through said slotted upright support post, said slotted post including equally spaced vertical slots of equal dimension, said rail including a vertical slot and a plurality of vertically spaced holes aligned with the slot, said bracket including a vertical member having three laterally extending fingers thereon with the upper and lower fingers being hook-shaped to extend through the rail and post and interlock therewith to secure the rail to the post, the dimensions and spacing of the post slots, slot and holes in the rail and the fingers on the bracket being such that the rail can be attached to the post in adjusted position fractionally of the vertical distance between the post slots as well as adjusted positions coinciding with the vertical distance between the post slots.

4,228,907

MINIATURE RAILROAD UNCOUPLING APPARATUS

John Werner, 11455 Tampa St., Northridge, Calif. 91324

Filed Jul. 17, 1978, Ser. No. 869,645
Int. Cl.[3] B61G 1/00, 3/00, 5/00, 7/00
U.S. Cl. 213—75 TC 11 Claims



1. A portable uncoupling apparatus for use with a miniature railroad system comprising:

base means for locating and securing the apparatus when placed between two rails of a miniature railroad track to restrict side motion; and

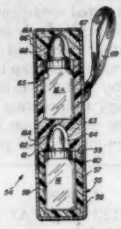
a resilient strap having a width less than the distance between the rails and having a raised portion along its length and inclines forming ramps on either side of the raised portion's highest point, said strap being attached to the base means on one side of the raised portion whereby the strap may be depressed towards the base means without buckling, and said strap being oriented along the base means with its length substantially parallel to the rails and being positioned to one side between said rails whereby the strap lifts only one of at least two vertical lift pins of two engaged couplers between connecting miniature railroad cars, said strap having adequate stiffness to raise the lift pin but sufficient flexibility to depress under the weight of axles of miniature railroad cars passing over the strap.

4,228,908

BABY BOTTLE CARRIER

Timothy J. Tweeton, 6808 N. 10th Pl., Phoenix, Ariz. 85014

Filed Nov. 8, 1978, Ser. No. 958,814
Int. Cl.[2] A45C 11/00; A61J 9/00
U.S. Cl. 215—11 C 7 Claims



1. An insulated baby bottle carrier comprising:

an elongated housing having a bottom portion and a cap interconnected by an open ended hollow shell,

an insulating porous sleeve fitted into said bottom portion and defining a first cavity extending longitudinally thereof for receiving in a snugly fitting arrangement the bottle portion of a first baby bottle,

said shell being provided internally thereof with an elongated insulating insert which is provided with second and third cavities one extending into each end thereof,

said second cavity being positioned and conformed to receive the extended nipple of the first baby bottle when positioned in said porous sleeve and when said shell is engaged with said bottom portion,

the third cavity being formed to receive the bottle of a second baby bottle, and

an insert mounted within said cap and provided with a cavity,

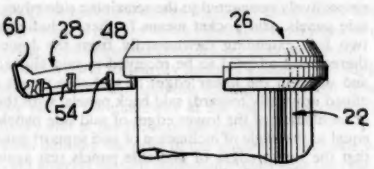
the cavity of said cap being positioned and conformed to receive the extended nipple of a second baby bottle positioned in said third cavity of said shell.

4,228,909

SQUEEZE-OFF CLOSURE WITH TAMPER INDICATING BAND

Frank H. Lecinski, Jr., Harwood Heights, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,932
Int. Cl.[3] B65D 41/32
U.S. Cl. 215—253 18 Claims



1. A closure assembly comprising a closure member including a one piece body having a generally flat full end panel and

a depending skirt; a separate sealing ring within said body for sealingly engaging a container terminal sealing surface, and a tamper indicating ring carried by said skirt, said tamper indicating ring having a portion removable therewith disposed radially inwardly of and within said skirt for normally preventing radial inward deflection of said skirt sufficient to effect deformation of said sealing ring to a non-sealing configuration.

4,228,910

DEVICE FOR TIGHTLY STOPPING A BOTTLE

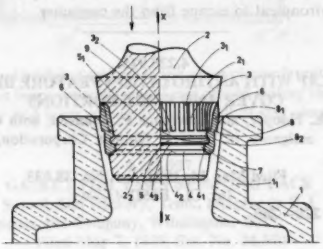
Rene E. L. Barre, 39, boulevard Bourdon, Paris, France

Filed Oct. 18, 1978, Ser. No. 952,285

Claims priority, application France, Jul. 19, 1978, 78 21447

Int. Cl.³ B65D *39/00*

U.S. Cl. 215—364 **3 Claims**



1. An improved stopping device for tightly stopping a bottle comprising a stopper having a body portion provided with at least one neck receiving a flexible fluid-tight sealing ring, the neck having at least one toothed surface and at least one smooth surface, the stopping device being designed and arranged such that the smooth surface is formed at the bottom of an annular groove bounded by two edges, one edge on each side of said annular groove, one of the sides of said groove being constituted by the edge of a rib formed in the bottom of the neck and the depth of said groove corresponding to the depth of the base of said toothed surface.

4,228,911

ROLLER CHIMES FOR CLOSED HEAD DRUMS

Theo Hammes, Cologne, Fed. Rep. of Germany, assignor to Mauser-Kommandit Gesellschaft, Bruhl, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 955,616

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1978, 2815326

Int. Cl.³ B65D *90/02*

U.S. Cl. 220—1 R **11 Claims**

1. A closed head drum formed of a thermoplastic material parison blown within a mold openable horizontally along a vertical plane and comprising:

(a) a head end;

(b) a bottom end spaced from said head end;

(c) a side wall formed integrally with and extending between said head and bottom ends, said said wall forming the lateral closure of the drum and having an increased wall thickness on diametrically opposite sides thereof; and

(d) at least one roller chime formed integrally with and extending circumferentially around said side wall, said roller chime being L-shaped and comprising:

(1) a first leg extending radially outwardly from said side wall,

(2) a second leg extending from and transversely of the radially outer end of said first leg so that said second leg extends generally in the same direction as said side wall,

(3) said second leg being spaced radially outwardly from the outer surface of said side wall and forming, in combination with said side wall and said first leg, an annular recess extending circumferentially around the drum, and

(4) a portion of said chime having a variable thickness with the maximum thickness of said portion being located at said diametrically opposite sides and the minimum thickness thereof located between said diametrically opposite sides.

4,228,912

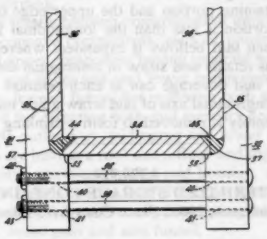
CONTAINER

Clifford E. Harris, Billericay, and Norman B. Spary, Chatham, both of England, assignors to EPS (Research and Development) Limited, Sittingbourne, England

Continuation-in-part of Ser. No. 714,398, Aug. 16, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,414

Int. Cl.³ B65D *6/32*

U.S. Cl. 220—4 R **13 Claims**



1. A packaging container comprising a base and a plurality of side walls upstanding from the base, the base and each respective side wall being formed from a substantially rigid panel, there being joints between the base and each side wall and between each side wall and each adjacent side wall, each said joint comprising a member of cold cured elastomer which has been cured in situ and which forms a flexible element securing the panels together to form a packaging container having waterproof and flexible shock resistant joints between the substantially rigid panels.

4,228,913

BEVERAGE CAN HAVING A SELF CONTAINED STRAW

Alberto Mack, and Charing Mack, both of 32 Harmony St., Piscataway, N.J. 08854

Filed Apr. 19, 1979, Ser. No. 32,109

Int. Cl.² A47G *19/22*

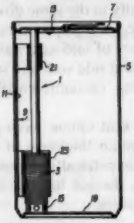
U.S. Cl. 220—90.2 **3 Claims**

1. A tab top beverage can having a self-contained straw assembly, comprising:

(a) a beverage can having a top including a tab top opening assembly for forming a drinking slot;

(b) a drinking straw contained within said beverage can, said straw having a top end abutting the underside of said tab top opening assembly, and a bottom end having a biasing means including a compressible, integrally formed resilient bellows for biasing said top end against said underside of said tab top opening assembly and pushing said top end of said straw through said drinking slot when said tab top assembly is removed to open said can, and

(c) an elongated straw guide means mounted on the inside of said beverage can in alignment with the longitudinal axis of said can for aligning said top end of said straw with said underside of said tab top opening assembly, said straw guide means including:



(i) a top retaining portion for slidably receiving and aligning said top end of said straw with said underside of said tab top opening assembly, said top retaining portion having a lower edge for obstructing slidable movement of said bellows of said straw through said top retaining portion, and

(ii) a bottom retaining portion for slidably receiving said bellows of said straw and for securing said bellows within said can,

wherein the longitudinal distance between said lower edge of said top retaining portion and the upper edge of said bottom retaining portion is less than the longitudinal length of said bellows when said bellows is expanded, whereby said straw guide means retains said straw in orthogonal disposition with said top of said beverage can at each position of said straw along the longitudinal axis of said straw guide means after said tab top assembly is removed to form a drinking slot.

4,228,914

STERILIZED STORAGE CONTAINER

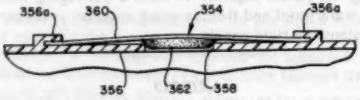
Roger S. Sanderson, 24662 Santa Clara Ave., Dana Point, Calif. 92629

Continuation-in-part of Ser. No. 710,521, Aug. 2, 1976, abandoned, which is a continuation of Ser. No. 501,183, Aug. 28, 1974, abandoned. This application Mar. 1, 1978, Ser. No. 882,489

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[3] **A61B** *19/02;* **A61L** *2/06, 2/26;* **B65D** *81/20*

U.S. Cl. 220—203 **1 Claim**



1. Apparatus for containing items while being sterilized or stored comprising:

means defining a container;

means in a wall of the container for permitting access to the container interior; and

means responsive to a sterilizing environment applied to the container interior and exterior to close said container access means after its contents have been sterilized to prevent further environment from entering the container after sterilization, said container being constructed so that further environment cannot enter the container after said access means is closed;

said responsive means including pressure responsive means for permitting said sterilizing environment to escape from said container when the gaseous pressure in the container exceeds the pressure outside the container a slight amount;

said means responsive to the sterilizing environment including a temperature responsive valve which closes automatically after said items have been subjected to a sterilizing temperature long enough to sterilize said items, and said valve being also constructed to serve as a pressure responsive check valve and form the means for permitting said environment to escape from the container.

4,228,915

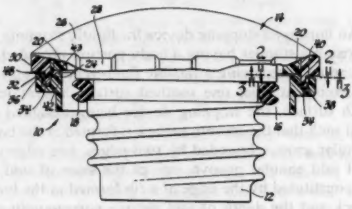
FUEL CAP WITH ANTIROTATION FEATURE BETWEEN COVER AND SKIRT PORTIONS

Robert E. Hooper, and Lawrence P. Johnson, both of Huron, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 14, 1979, Ser. No. 38,633

Int. Cl.[3] **B65D** *41/04*

U.S. Cl. 220—288 **1 Claim**



1. A fuel cap comprising; a handle member having an axially extending wall portion with a radially extending axially facing locking surface adjacent the distal end thereof, a cover portion, and a plurality of spaced radially extending protuberances on said wall portion extending between said radially extending locking surface and said cover portion; closure means operatively rotatably connected with said handle; and a skirt member having a plurality of spaced locking tabs each having a radially extending face abutting said locking surface on said handle member, shoulder means for preventing axial separation of said closure means relative to said handle member, and said spaced locking tabs each having a circumferential dimension substantially equal to said space between said spaced protuberances and each locking tab having radially extending end walls axially aligned to radially mate with the radial extent of said spaced protuberances whereby relative rotation between said handle and skirt is limited.

4,228,916

PLASTIC PAINT BUCKET WITH METAL SEALING RING

Rolf E. Weingardt, Scarsdale, N.Y., assignor to Standard Container Company, Montclair, N.J.

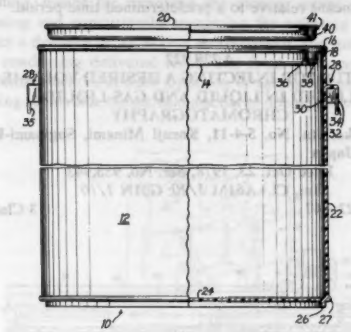
Filed Jul. 20, 1978, Ser. No. 926,542

Int. Cl.[3] **B65D** *43/06*

U.S. Cl. 220—354 **18 Claims**

1. A container, comprising a plastic bucket having a closed bottom and an open top, said bucket including a sidewall, having a generally circular lateral cross-sectional shape, and a top rim formed as an annular upwardly opening channel having an inner circumferential wall and an outer circumferential

wall connected at their lower ends to each other and said sidewall; and a double-tight metal sealing ring disposed in said



channel and bridging said inner and outer circumferential walls thereof, an inner circumferential end of said sealing ring being hidden by said inner circumferential wall of said channel.

4,228,917

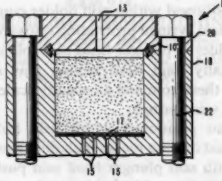
GASKET FOR YARN SPINNING PACK

Lyles H. Sowell, Old Hickory, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1979, Ser. No. 36,540

Int. Cl.³ B65D *53/00*

U.S. Cl. 220—378 **1 Claim**



1. In a polymer filter that includes a body and a lid joined together at juncture surfaces, said surfaces having matching annular V-shaped grooves forming a chamber, the improvement comprising a ring gasket of cold-flowable metal in said chamber, said ring gasket having an inner peripheral surface that includes a circumferential groove, and a height greater than the combined depth of the V-shaped grooves whereby the gasket is compressed when said lid and said body are joined together and said gasket permanently increases in thickness as its height is reduced.

4,228,918

CUP DISPENSING APPARATUS

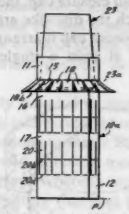
Thomas W. Kellogg, Irvine, Calif., assignor to American Can Company, Greenwich, Conn.

Filed Jan. 12, 1979, Ser. No. 3,088

Int. Cl.³ A47F *1/06*

U.S. Cl. 221—65 **19 Claims**

11. Cup dispensing apparatus comprising: a sleeve of flexible and resilient material for containing a stack of nested cups, said sleeve including at least one set of a plurality of axially extending circumferentially spaced wall-defining strips of uniform length; circumferentially aligned means intermediate ends of said strips defining weakened foldable regions; and detent means disposed toward one end of said sleeve for engagement by the rim of a cup to retain said stack of nested cups in said sleeve, said sleeve being collapsible by folding of said strips about said weakened foldable regions and about ends thereof outwardly of said sleeve upon forcibly urging ends of said sleeve relatively toward one another, as cups are removed past



said detent means, from said stack in said sleeve, thereby to maintain engagement of said detent means with a cup rim.

4,228,919

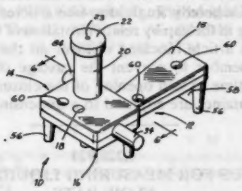
DENTAL AMALGAM DISPENSER

Maurice M. Weikel, 1050 Greenfield Dr., El Cajon, Calif. 92021

Filed Sep. 8, 1978, Ser. No. 940,704

Int. Cl.² B65B *1/30*

U.S. Cl. 221—96 **7 Claims**



1. A dispenser for liquid mercury and silver for mixture in an amalgam comprising:

a bifurcated plastic housing constructed of upper and lower discrete concave components, each of unitary construction, said upper component having separate inlet ports for mercury and silver and said lower component having an integrally formed funnel for receiving both mercury and silver and for directing both said mercury and said silver to a single outlet port, said upper and lower components respectively having a roof and a floor and together defining a hollow enclosure within said housing, wherein said housing is formed with a pair of parallel spaced tracks on opposite sides thereof laterally bracketing said inlet ports and said outlet port and said funnel,

a plastic carriage having an open rectangular frame with opposing side rails disposed to ride in reciprocating movement along said tracks and opposing transverse ends, and said carriage is movable entirely

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4,228,920

DISPENSER FOR SMALL ARTICLES HAVING ARTICLE ORIENTATION MEANS

George W. Burton, London, England, assignor to Johnson & Jorgensen (Plastics) Limited, United Kingdom

Filed Aug. 14, 1978, Ser. No. 933,433

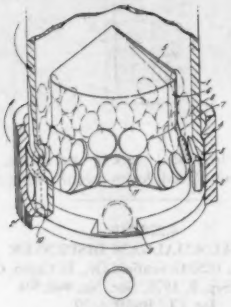
Claims priority, application United Kingdom, Aug. 15, 1977, 34158/77

Int. Cl.³ B65D *83/04*

U.S. Cl. 221—265 **8 Claims**

1. A dispenser for dispensing disc-like articles one at a time from a supply of said articles, the dispenser comprising a container for the supply of disc-like articles and a closure cap for an open end of the container, a segregating and orienting member on the cap projecting inside of the container and defining with the container side wall a restricted passage of

sufficient width only to receive a plurality of the disc-like articles on their edges, said passage being of insufficient width to receive said articles with their major end faces across the axis of the container and closure cap, the closure cap having an opening through which the disc-like articles one at a time are dispensed while the closure cap is arranged lowermost and the container uppermost, at least a single article receptor and



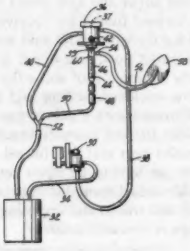
transport pocket in the side wall of the container at the open end thereof whereby single disc-like articles are delivered to said opening in the cap by relative rotation of the container and cap, and an article blocking element on the segregating and orienting member to prevent the passage of more than one article at a time to said opening of the closure cap when said cap and container are adjusted to a dispensing position.

4,228,921

APPARATUS FOR MEASURING LIQUID DEVELOPER FLOW RATE

Stephen Ernohazy, Mt. Prospect; Frederick D. Meller, Lomard, and Eugene P. Oddo, Mt. Prospect, all of Ill., assignors to AM International, Inc., Los Angeles, Calif.

Filed Sep. 25, 1978, Ser. No. 945,404
Int. Cl.³ G01F *11/32*
U.S. Cl. 222—40 **8 Claims**



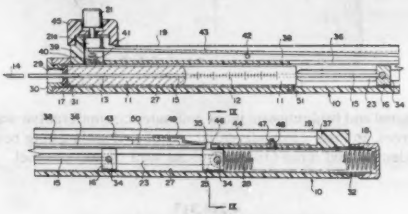
1. An apparatus for measuring the flow rate of aqueous ammonia in a diazotype copy machine, comprising:
- a supply source for aqueous ammonia;
- a flowmeter means;
- means for supplying the aqueous ammonia from the supply source to the flowmeter means;
- metering means for dispensing metered quantities of the aqueous ammonia from the flowmeter means;
- reservoir means mounted on the flowmeter means for receiving the aqueous ammonia dispensed therefrom;
- valve means actuable between a closed condition for retaining the aqueous ammonia in the reservoir means and an open condition for draining the aqueous ammonia from the reservoir means; and
- indicator means on the reservoir means for measuring the flow rate, subsequent to actuation of the valve means from the open to the closed condition, providing an indication of the quantity of aqueous ammonia received by the reservoir means relative to a predetermined time period.

4,228,922

APPARATUS FOR INJECTING A DESIRED VOLUME OF LIQUID IN LIQUID AND GAS-LIQUID CHROMATOGRAPHY

Ryuzo Takeshita, No. 5-4-11, Koenji Minami, Suginami-Ku,-Tokyo, Japan

Filed Oct. 23, 1978, Ser. No. 953,943
Int. Cl.³ A61M *5/20*; G01N *1/10*
U.S. Cl. 222—47 **3 Claims**



1. An apparatus for injecting a desired volume of a liquid in liquid and gas-liquid chromatography comprising:
- a tubular holder defining a lengthwise recess in a wall of an upper part, a cylindrical shell-shaped cover extending over the upper part;
- a syringe positioned within said holder comprising, a needle joined to said syringe protruding outwardly from one end of said holder, a plunger head movable inside said holder longitudinally, said head having pins and guide knobs extending therefrom and a capacity scale formed in a side surface of said syringe;
- driving means positioned within said holder behind said plunger, said driving means including a push piece lying in contact with said plunger head said push piece having a protuberant pin, guide knobs, and guide knob pins attached to said push piece and a spring inserted between said push piece and the other end of said holder;
- a window formed in a side surface of the part of said holder containing said syringe so as to read said capacity scale of said syringe;
- first slots formed in side surfaces of said holder, said guide knobs protruding from sides of said push piece and said plunger head through said first slots;
- a start button disposed at one end of said recess;
- a lever arranged in said recess a portion of which is held in contact with said start button; and
- a mechanism locking said push piece in an urged position and including a flat spring arranged in contact with the other end of said lever in said recess and an hole provided in a flat portion of said flat spring and engaging with said protuberant pin of said push piece.

4,228,923

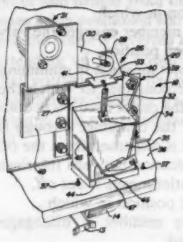
ICE MAKER DISPENSER STRUCTURE

Walter C. Barnard, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 17, 1979, Ser. No. 67,536
Int. Cl.³ B65G *65/48*
U.S. Cl. 222—52 **14 Claims**

1. In an ice maker having a storage receptacle for holding a plurality of discrete ice bodies having a discharge opening, agitating means in the receptacle for agitating the ice bodies adjacent the discharge opening to promote free delivery of the ice bodies through the discharge opening during a dispensing

operation, closure means for selectively closing the discharge opening, means for removing the closure means from said opening and concurrently energizing the agitating means to effect a delivery of ice bodies therethrough, and guide means for conducting delivered ice bodies from said opening to a dispense position, at least a portion of said guide means comprising removable means, said discharge opening being accessi-



ble to a user's fingers upon removal of said removable means, the improvement comprising:

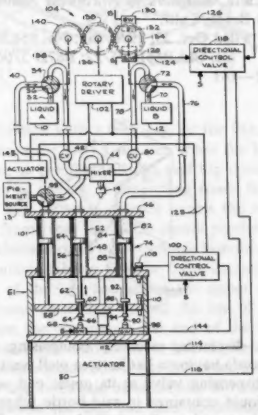
means responsive to removal of said removable means of the guide means to prevent removal of the closure means from said opening thereby to prevent injury to said user's fingers by said agitating means during an attempted dispensing operation.

4,228,924

MIXTURE METERING MACHINE

Charles H. Gilbert, 2101 Camino Rey, Fullerton, Calif. 92633

Filed Aug. 23, 1978, Ser. No. 936,312
Int. Cl.[3] B67D *5/08*
U.S. Cl. 222—63 **5 Claims**



1. A machine for metering fluids in a precise mixture to an outlet chamber from a plurality of pressurized sources, comprising:

a plurality of cylinder structures coinciding in number to said plurality of pressurized sources, each of said cylinder structures including piston means for varying the operating volume of said cylinder structures to receive and discharge said fluids;

a plurality of positive control two-state valve means coinciding in number to said cylinder structures, said valve means being connected to control the flow of fluids into said cylinder structures from said pressurized sources and out of said cylinder structures to said outlet chamber;

independent switch means for each of said piston means for sensing the positions of said piston means whereby to indicate that each of said piston means has attained a predetermined bottom position in one of said cylinder means;

actuator mens loosely coupled to linearly drive said piston means for moving said piston means from said predetermined bottom positions to meter fluids therefrom; and

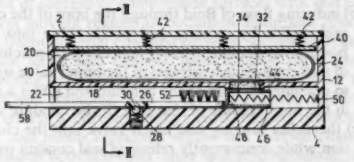
control means for said actuator means and said positive control valve means whereby upon said independent switch means indicating that said piston means have attained said bottom position, said control valves are set to provide passages from said cylinder means to said outlet chamber and said actuator drives said piston means to meter fluid from said cylinder means until said piston means attains a predetermined top position in said cylinder means, whereupon said actuator means is de-energized and the states of said valve means are changed to provide passages from said sources to said cylinder structures.

4,228,925

TOOTHPASTE HOLDER AND DISPENSER

Isaac Mendelovich, 1936 Kentwood St., Philadelphia, Pa. 19116

Filed Sep. 22, 1977, Ser. No. 835,749
Int. Cl.[2] F65D *35/20, 35/36*
U.S. Cl. 222—103 **4 Claims**



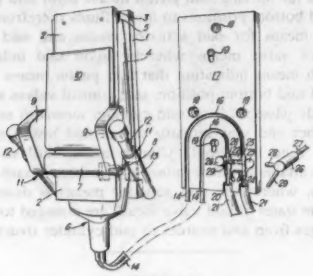
1. A toothpaste holder and dispenser, comprising: a housing including a first compartment having a greater length than width for receiving a collapsible tube of toothpaste; a pressure member in said first compartment for collapsing the tube to dispense toothpaste therefrom; a second compartment of substantially the same length as said first compartment for receiving a toothbrush therein; said second compartment being closed at one end and open at the opposite end for receiving the toothbrush through the open end; a partition wall common to and separating both said compartments and formed with a dispensing opening therethrough adjacent to the closed end of the second compartment for dispensing the toothpaste from the collapsible tube in the first compartment to the toothbrush in the second compartment; a closure member in said second compartment adjacent to its closed end; and a spring urging said closure member away from said closed end to underlie said dispensing opening in the partition wall; said second compartment being of sufficient length to retain the toothbrush in a first position therein and to permit the toothbrush to be manually moved towards the closed end of the second compartment to engage the closure member and to move same towards the closed end of the second compartment, thereby to uncover said dispensing opening and to permit the dispensing of toothpaste therethrough onto the toothbrush, said second compartment further including detent means for retaining the toothbrush in said first position therein, said detent means comprising a spring-urged ball disposed in the bottom wall of the housing and receivable in a recess formed in the toothbrush handle, and guide means for guiding the movement of the toothbrush from said first position to engage said closure member and to move same towards the closed end of the second compartment.

4,228,926

DISPENSING VISCOUS FLUIDS

Alan J. Gordon, Liverpool, England, assignor to Shandon Southern Products Limited, Cheshire, England

Filed Mar. 6, 1978, Ser. No. 883,465
Int. Cl.[3] B67D *3/00*
U.S. Cl. 222—103 12 Claims



1. A method of dispensing a viscous fluid from a discharge orifice in a fluid flow path constituted at least in part by the bore of a resilient conduit, comprising

(a) feeding the fluid under a constantly maintained pressure to a pinch valve movable between an open and closed position and capable of squeezing or pinching the conduit in the closed position to occlude the bore of the conduit;

(b) inducing flow of fluid through the bore of the conduit to said orifice by moving said pinch valve into the open position while concurrently squeezing or pinching a part of said conduit downstream of the pinch valve so as partly to occlude the bore of the conduit, and effect a reduction in the bore volume of that part of the conduit; and

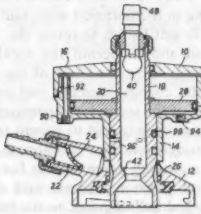
(c) thereafter moving said pinch valve into the closed position while concurrently releasing said conduit part downstream of said pinch valve to increase the volume of said part of the conduit by an amount at least sufficient to accommodate any expansion of the fluid in said downstream conduit part.

4,228,927

LIQUID DISPENSING HEAD AND INSTALLATION

Jozef Beyens; Guillaume Dewit, and Jules Lambrechts, all of Ruisbroek aan de Rupel, Belgium, assignors to Konstruktie J. Lambrechts p.v.b.a., Ruisbroek aan de Rupel, Belgium

Filed Oct. 30, 1978, Ser. No. 956,357
Claims priority, application United Kingdom, Mar. 7, 1978, 09018/78
Int. Cl.[3] B67D *1/04*
U.S. Cl. 222—148 11 Claims



1. A dispensing head adapted to be fitted to a container having a valve plunger with which the dispensing head cooperates to enable liquid in the container to be dispensed through the dispensing head under pressure of a gas supplied to the container through the dispensing head, the dispensing head comprising:

a. a body;

b. gas inlet means in said body for connection to a source of the pressurising gas;

c. rinsing fluid inlet means in said body for connection to a source of rinsing fluid;

d. outlet means for connection to a dispensing tap;

e. a valve member vertically movable in said body between a first position in which:

(i) the valve member engages the valve plunger and holds it in its open position,

(ii) the gas inlet means is in communication with the interior of the container to which the dispensing head is fitted and the outlet means is in communication with the interior of the container through the valve plunger so that liquid is dispensed from the container, and

(iii) communication between the rinsing fluid inlet means and the outlet means is cut off,

and a second position in which:

(i) the valve member is disengaged from the valve plunger, and

(ii) the outlet means is disconnected from the interior of the container and placed in communication with the rinsing fluid inlet means so that rinsing dluid flows through the outlet means;

f. a piston fixed to said valve member and movable in a cylinder forming part of said body;

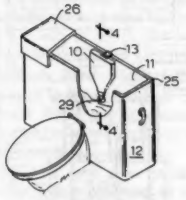
g. control inlet means for connection to the source of rinsing fluid, said control inlet means opening into said cylinder so that when rinsing fluid is supplied to the control inlet means the pressure of the rinsing fluid acts on the piston to urge the valve member to said first position.

4,228,928

BOTTLE WITH A CLIP FOR SUSPENDING THE BOTTLE IN INVERTED POSITION

Harvey L. Hocker, Fort Bragg, and John M. Alcamo, Modesto, both of Calif., assignors to Northwest Sanitation Products, Inc., Fort Bragg, Calif.

Filed Oct. 25, 1978, Ser. No. 954,362
Int. Cl.[3] B65D *25/22;* B67D *5/06*
U.S. Cl. 222—181 10 Claims



1. A liquid-dispensing assembly, comprising:

a plastic bottle having a flat bottom wall, vertical side walls, and a dispensing valve at its upper end, adapted to dispense liquid contained in said bottle when said bottle is inverted, one side wall and said bottom wall of said bottle being formed to provide an inset recess in said one side wall extending to said bottom wall, said recess including two facing side wall portions with an inset wall between them, and a pair of pivot receptacles horizontally opposite each other in the facing side wall portions adjacent and spaced up from the bottom end of said recess,

a hanger, comprising a flat main bottle-support portion, lip means generally perpendicular to said flat portion at one end thereof, cooperating flange means generally perpendicular to said flat portion at the other end of the flat portion, a pair of opposed pivot nipples on a horizontal axis at the opposite end of the hanger from the lip means,

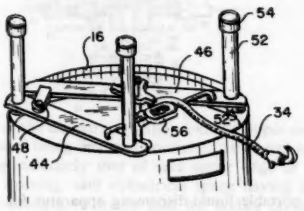
on the other side of the flange from the flat portion and offset from the plane of the flat portion, inwardly with respect to the recess, said pivot nipples being engaged in said pivot receptacles, and stop means on the hanger for engaging the inset wall of the recess in abutting relation to the vertical plane of the inset wall when the hanger is in extended position with the flat portion approximately perpendicular to the bottle side wall and approximately parallel to the bottom wall, and for preventing further pivotal movement of said hanger from the extended position, said stop means being positioned above the axis of the pivot nipples when the bottle is inverted and the hanger is extended, and extending up to a position approximately flush with the flat portion of the hanger and with the bottom wall of the bottle, said hanger when pivoted into a stored position lying in said recess substantially flush with said one side wall.

4,228,929

STAND FOR HOLDING A BEER KEG IN POSITION FOR GRAVITY FEED

Charles Gross, Saddle Brook, N.J., assignor to Vending Components, Inc., Hackensack, N.J.

Filed May 2, 1979, Ser. No. 35,218
Int. Cl.³ B67D *1/06*
U.S. Cl. 222—185 **7 Claims**



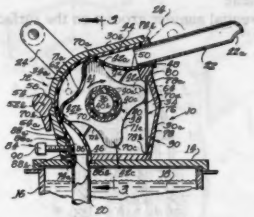
1. The combination with a beer keg, or the like, having an end that comprises the top of the keg when the keg is in an upright position, an opening through said top communicating with the interior of the keg, a supporting frame that fits over the top of the keg and that extends across the top with an opening in the frame that leaves the center portion of the top unobstructed, characterized by detachable fastening means for securing the frame to the keg with the frame extending upward above the top of the keg and above the upper end of said opening, the frame extending beyond the top of the keg far enough to space the opening in the end of the keg from a substantially horizontal surface over which the keg is supported when turned upside down, the frame being long enough to support the keg over said substantially horizontal surface with space between the keg and said horizontal surface to provide clearance for a hand to reach under the upside down keg to said opening through the end of the keg, and the frame having part of the circumference thereof open to provide access for a hand to reach under the end of the keg to said opening, and further characterized by the frame having elements that fold with respect to one another including an element that moves into one position that prevents the elements from folding with respect to one another and that moves into another position to permit the elements to be disconnected from the keg and folded into a space of lesser extent than they occupy when secured to the keg.

4,228,930

DISPENSING PUMP

Lawrence R. Hogan, Lake Villa, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Sep. 9, 1977, Ser. No. 831,731
Int. Cl.² F04B *43/12*
U.S. Cl. 222—212 **15 Claims**



1. A dispensing pump comprising a housing defining an internal chamber, a compressible tubular conduit having a portion disposed within said chamber and adapted to pass a fluent material therethrough, actuating means including an actuating shaft rotatably supported by said housing and extending into said chamber, a rotor mounted on said actuating shaft for rotation therewith in said chamber, said rotor defining a plurality of compression surfaces circumferentially spaced about the axis of rotation of said rotor radially equidistant therefrom, said internal chamber defining a confining surface spaced from said rotor so that rotation of said rotor effects engagement of successive compression surfaces with said conduit to form moving regions of occlusion along said conduit and move fluent material confined between successive regions of occlusion along said conduit, unidirectional drive means interconnecting said actuating means to said rotor so that rotation of said actuating shaft in a predetermined rotational direction effects a corresponding predetermined rotation of said rotor, and means supported within said internal chamber for cooperation with said rotor upon said predetermined rotation thereof so as to bias said rotor in a rotational direction opposite said predetermined rotation each time said rotor completes said predetermined rotation, whereby fluent material in said conduit downstream from said rotor is caused to be drawn back from a dispensing end of said conduit to prevent dripping therefrom.

4,228,931

MANUALLY OPERATED PUMP FOR DISPENSING MICRONIZED LIQUIDS AT A PREDETERMINED PRESSURE

Tommaso Ruscitti; Giovanni Albini, and Roberto Torretta, all of Milan, Italy, assignors to ADM S.p.A., Milan, Italy

Filed Jan. 11, 1979, Ser. No. 2,767
Claims priority, application Italy, Feb. 9, 1978, 20110
Int. Cl.² G01F *11/36*
U.S. Cl. 222—321 **2 Claims**

1. A manually operable pump for dispensing atomized liquids at a predetermined pressure, comprising:

a hollow body having a top end and a bottom end, said bottom end including a one way valve for permitting liquid only to enter the cavity of said body, said hollow body including a stop edge on the surface of the cavity of said body intermediate said top and bottom end;

a stem having a first end normally in said hollow body and second end extending out of said top end of said hollow body, said stem including a longitudinal bore extending from said second end to adjacent said first end, said stem also including a first stop edge and a second stop edge intermediate said first stop edge and said second end;

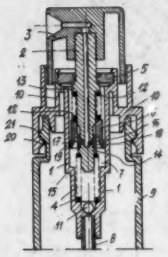
an annular shaped gasket surrounding said stem, said gasket sealing said cavity, said gasket also including a substan-

tially cylindrical tubular extension of resiliently deformable material, said extension having a bottom edge and closely surrounding said stem;

a first spring connected between said body and said stem and operable to bias said stem out of said top end of said body;

a second spring connected between said second stop edge of said stem and said gasket and operable to bias said bottom edge of said tubular extension against said first stop edge of said stem;

a circumferential annular groove on the surface of said stem



adjacent said first end and normally surrounded by said tubular extension, said groove having a bottom edge; and

at least one radial bore in said stem, each said at least one radial bore extending from a portion of said longitudinal bore adjacent said first end of said stem to said annular groove,

whereby when bottom edge of said tubular extension uncovers said bottom edge of said groove, the pressure in said body cavity deforms said tubular extension into said groove to fully communicate said body cavity with said at least one radial groove.

4,228,932

SEALING STRUCTURE FOR ROTARY VALVES

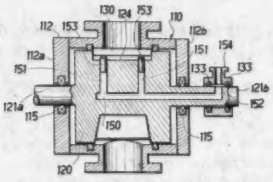
Tatuo Aonuma, Kashiwa; Michio Kiuchi, Nagareyama; Hirozi Watanabe, and Takeshi Akao, both of Noda, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Division of Ser. No. 740,391, Nov. 10, 1976, Pat. No. 4,180,188. This application Apr. 5, 1979, Ser. No. 27,514

Claims priority, application Japan, Nov. 18, 1975, 50-137794; Dec. 2, 1975, 50-160983

Int. Cl.³ G01F *11/10*

U.S. Cl. 222—368 **4 Claims**



1. A sealing structure for a rotary valve, comprising:

a rotary member provided with a plurality of pockets opening toward the outer periphery of said rotary member;

a casing enclosing the outer periphery of said rotary member;

sealing members provided between the outer periphery of said rotary member and the inner periphery of said casing;

said sealing members being formed to be adjustably projectable in the radial direction;

radial blades partitioning and separating said plurality of pockets provided in said rotary member;

cavities in the outer tips of said blades;

said sealing members being slidably fitted in said cavities to be pressed to project outwardly in the radial direction of said rotary member;

a first passage provided in the axial direction in the center portion of said rotary member;

a plurality of auxiliary passages within each said radial blade communicating with said first passage, and communicating with said sealing member containing cavities;

means for supplying, from outside, fluid under pressure to said first passage;

piston-shaped pushing members, each fitted at least partially in each said auxiliary passage, for projecting said sealing members radially outwardly in response to fluid pressure in said first passage; and

said piston-shaped pushing members being pressed so as to slide radially outwardly by said fluid pressure in said first passage so as to bear against and project said sealing members radially outwardly.

4,228,933

PRESSURIZED FLUID-DISPENSING APPARATUS

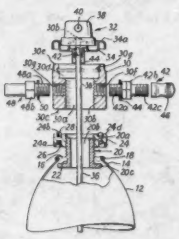
James T. Elson, 55 The Street, Shalford, Guildford, England

Filed Jan. 24, 1979, Ser. No. 6,020

Claims priority, application United Kingdom, Feb. 6, 1978, 04731/78

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—400.7 **4 Claims**



1. A portable liquid-dispensing apparatus for dispensing a liquid in the form of a jet, spray or aerosol, the apparatus comprising a container, a valve body having an annular top removably secured to the container whereby it can be removed to expose an aperture for charging the container with a liquid to be dispensed, first valve means mounted by a cup on said annular top of said valve body and resiliently biased towards a closed position, tube means for establishing fluid communication from near the bottom of the container to the first valve means, a manually operable push button on said valve body, a dispensing nozzle in a side wall of said push button communicating with said tube means wherein, in use, depression of said push button is arranged to open said first valve means to dispense the fluid under pressure, second valve means mounted on said valve body for connecting the container temporarily to an air compressor for pressurising the contents of the container, a third pressure relief valve means mounted on said valve body and arranged to open when the pressure in the container is greater than a predetermined valve.

4,228,934

ICE BODY DELIVERY APPARATUS

Keith E. Carr, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Belmont Harbor, Mich.

Filed Dec. 26, 1978, Ser. No. 972,805

Int. Cl.³ G01F *11/20*; B01F *7/24*

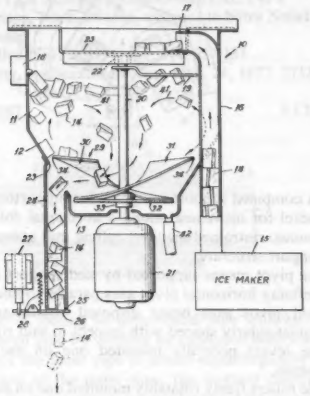
U.S. Cl. 222—412 **12 Claims**

1. In an ice body delivery apparatus having a hopper for storing a plurality of discrete ice bodies and having a wall

portion defining an outlet opening having an upper edge portion and a lower edge portion for passing the ice bodies seriatim outwardly therethrough for dispensing the same, the improvement comprising:

helical wall means in said hopper defining a vertical helix axis, an upwardly facing lifting surface, an under surface, a lower end, an upper end, a radially outer edge and a radially inner edge; and

driver means driving the lower end of the wall means for rotation of the wall means about said vertical axis with said outer edge sweeping said hopper wall portion and across said outlet opening as a result of said rotation, said inner edge defining an open cylindrical space about said vertical axis extending at least the full height between said upper and lower edge portions of the outlet opening, said driven lower end of the wall means being positioned at a level no higher than approximately that of said lower edge



portion of the discharge opening and said upper end of the wall means being free and positioned at a level no lower than approximately that of said upper edge of the discharge opening, said cylindrical space having a lateral extent sufficient to freely pass ice bodies downwardly therethrough and being unobstructed at the periphery thereof to pass the ice bodies outwardly therefrom to under said helical wall means, whereby said wall means lifts from said discharge opening ice bodies which may have lodged therein, and causes the lifted ice bodies to move to the open cylindrical space, and pass downwardly through the cylindrical space and substantially horizontally radially outwardly under the helical wall means under surface freely to said discharge opening, said wall means preventing the weight of the ice bodies in the hopper above the wall means from acting on the ice bodies moving outwardly under said under surface.

4,228,935

GLOVES AND HOLDING RACK THEREFOR

Robert M. Madray, P.O. Box 401, Blackshear, Ga. 31516

Filed Jan. 11, 1978, Ser. No. 868,509

Int. Cl.[2] A47J *51/06*

U.S. Cl. 223—111 **1 Claim**

1. A glove and holding rack comprising in combination;

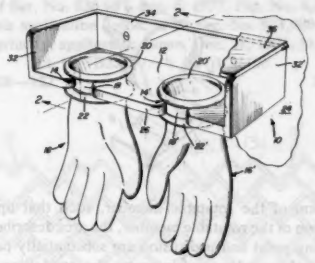
(a) A support provided with a planar bottom wall having a free edge;

(b) said free edge having at least one aperture shaped for receiving the wrist portion of a glove;

(c) a pair of substantially parallled, spaced side walls extending perpendicularly and codirectionally from the bottom wall;

(d) a back wall extending perpendicularly from the bottom wall and co-directionally with and extending between the side walls; and

(e) a top removable mounted on the side walls and the back wall, whereby a glove having a pair of spaced, substantially parallel retaining collars, each in the form of a solid toroid, may be receivable in the aperture provided in the



support, with one of the collars being arrangeable above the support for restraining the glove against movement relative to the support when a hand in being put into the glove, and the other of the collars being arrangeable beneath the support for restraining the glove against movement relative to the support when a hand is being removed from the glove.

4,228,936

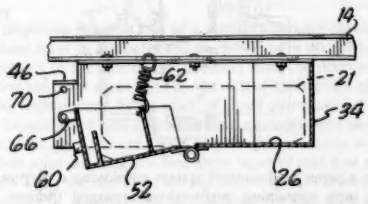
TIRE AND TOOL CARRIER

Orin S. Rife, Rte. 1, Elkland, Miss. 65644

Filed Aug. 15, 1979, Ser. No. 66,566

Int. Cl.[3] B60R *9/00, 27/00*

U.S. Cl. 224—42.23 **7 Claims**



1. A tire and tool carrier for vehicles, said carrier comprising a box-like support having means for attaching the support to the underside of said vehicle, said support comprising a stationary base for supporting said tire and cover forming a rear portion of said support having means hingedly connecting it to said base, said cover including a bottom wall hinged to said stationary base at a point to the rear of the mid point of said carrier, said bottom wall being bounded by opposed side walls and an intermediate rear wall and having arcuate upstanding tire positioning flange means defining corner spaces at a junction of each of said side walls with said rear wall for storage of tools and the like.

4,228,937

CLEAVING APPARATUS

Anthony J. Tocci, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1979, Ser. No. 25,098

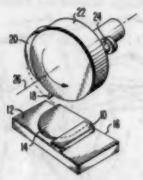
Int. Cl.[3] B26F *3/00*

U.S. Cl. 225—96.5 **5 Claims**

1. An apparatus for cleaving crystalline material, comprising:

(a) a platform for supporting the crystalline material thereon, having a substantially straight edge over which the crystalline material projects; and

(b) a rotatable member having a scribing point and protrusion extending substantially radially therefrom and located on a plane which is perpendicular to the axis of



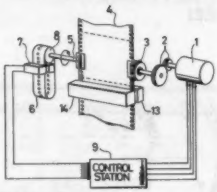
rotation of the rotatable member, such that upon axial rotation of the rotatable member, the arcs described by the scribing point and protrusion are substantially parallel to the platform edge, and intersect the crystalline material which projects over the edge such that a bending moment is created in that portion of the crystalline material which projects over the platform edge.

4,228,938

PAPER FEED CONTROL SYSTEM IN A PRINTER

Hisayoshi Monma; Shigenobu Katagiri, and Hiroomi Kozawa, all of Katsuta, Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,240
Int. Cl.³ B65H *25/10*
U.S. Cl. 226—9 **3 Claims**



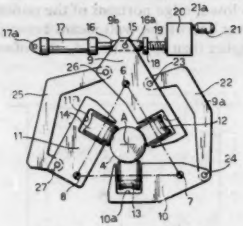
1. In a paper feed control system employing a prepunched format tape containing perforations arranged thereon in a direction of tape advancement for controlling paper feed, perforation sensing means for detecting perforations in said tape as said tape advances and for providing perforation signals, driving pulse generating means for generating driving pulses, a pulse motor steppingly rotatable in response to said driving pulses applied thereto to proportionately advance a printing paper whereat a line pulse is produced every one line advancement of said printing paper, means responsive to advancement of said printing paper to proportionately advance said tape, and a control station responsive to external feed command signals and to said perforation signals to provide said driving pulses and said line pulses, the improvement comprising: means for counting said driving pulses and for producing said line pulse upon counting a first predetermined number of driving pulses, driving pulse gating means for preventing said driving pulses from being applied to said pulse motor when said line pulse and one of said perforation signals are coincidentally provided and for permitting said driving pulses to be applied thereto in response to said external feed command signals, and means responsive to actuation of said control station and the receipt of said perforation signal to preload said counting means with a second predetermined number of driving pulses less than said first predetermined number of driving pulses, whereby each of said line pulses is generated in the approximate midpoint of each of said perforation signals.

4,228,939

COMBINED SUPPORT AND GUIDE FOR THE MANDREL OF A RESTRAINED MANDREL CONTINUOUS ROLLING MILL

Filippo Cattaneo, Milan, Italy, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Sep. 28, 1978, Ser. No. 946,792
Int. Cl.³ B65H *17/34*
U.S. Cl. 226—172 **3 Claims**



1. A combined support and guide for supporting and guiding a mandrel for movement along a horizontal rolling axis of a continuous, restrained-mandrel rolling mill comprising:

a support structure,

three pivot means supported by said support structure and defining horizontal pivot axes parallel to said rolling axis, said pivot axes being disposed equidistant from and equiangularly spaced with respect to said rolling axis,

three levers pivotally mounted one on each said pivot means,

three rollers freely rotatably mounted one on each said lever about an axis of rotation which intersects the respective pivot axis of the lever, said axes of rotation of said rollers lying in a common plane perpendicular to said rolling axis,

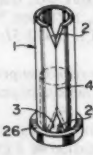
drive means for driving angular displacements of said levers simultaneously about the respective said pivot axes to displace the rollers with respect to said rolling axis by the same amount and in the same sense to accommodate and support a mandrel between them in coaxial alignment with said rolling axis.

4,228,940

TAPE GUIDE MEANS FOR RECORDING AND/OR REPRODUCING APPARATUS AND METHOD OF MANUFACTURING THE SAME

Yozaburu Umehara, 2-8-6, Shakujiimachi, Nerima-ku, Japan

Filed Sep. 7, 1978, Ser. No. 940,198
Claims priority, application Japan, Sep. 14, 1977, 52-124344[U]; Mar. 3, 1978, 53-24344
Int. Cl.³ B65H *23/04, 27/00*
U.S. Cl. 226—196 **15 Claims**



1. Tape guide means for recording and/or reproducing apparatus, comprising a non-magnetic base body and a non-

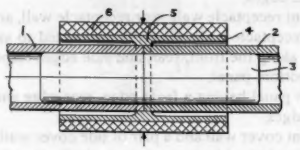
magnetic hard surface layer formed on said base body, said surface layer having rounded microscopic tips whose surface roughness is obtained by surface grinding of the circumferential surface of said surface layer after said surface layer is formed on said base body, thereby the pattern of said microscopic tips extends substantially linearly in the traverse direction to the axial direction of the tape guide means.

4,228,941

METHOD OF JOINING AN INNER METAL PIPE WITH AN OUTER SURROUNDING METAL PIPE

Ingemar P. Persson, Nora, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Nov. 2, 1978, Ser. No. 957,131
Claims priority, application Sweden, Nov. 24, 1977, 7713287
Int. Cl.³ B23K *20/08*
U.S. Cl. 228—107 **9 Claims**



1. A method of joining an inner metal pipe with an outer surrounding metal pipe by welding by explosion such that the outer surface of the inner pipe is joined metallurgically with the inner surface of the outer pipe, the method comprising placing inside the inner pipe a contact body which prevents a change of the inside diameter of the inner pipe, said contact body being a rigid body made of salt.

4,228,942

METHOD OF PRODUCING ABRASIVE COMPACTS

Rainer Dietrich, 5 Mooregrove, Kibler Park, Johannesburg, Transvall, South Africa

Filed May 31, 1978, Ser. No. 911,107
Claims priority, application South Africa, Jun. 24, 1977, 77/3813
Int. Cl.³ B23K *1/04;* B24D *3/06*
U.S. Cl. 228—121 **16 Claims**

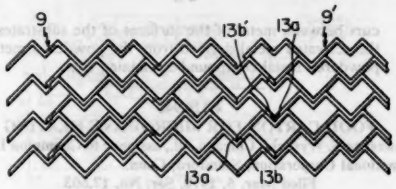
1. A method of bonding a diamond or cubic boron nitride abrasive compact to a second such compact or to a cemented carbide support including the steps of depositing a layer of a transition metal on the first compact in unbonded condition, depositing a layer of a braze alloy on the transition layer in unbonded condition, the braze alloy having a melting point in the range 650° C. to 750° C. and being capable of alloying with the transition metal, then, with the two layers unbonded to each other and the first compact, placing the second compact or carbide support on the braze layer; and heating the thus-formed unbonded assembly at a temperature between 650° C. and 750° C. for a period of 2 to 180 minutes with the first and second compacts clamped together at a pressure of between 72.5 and 1450 lbs/sq. inch to produce an alloy bonding layer bonding the first compact to the second compact or carbide support.

4,228,943

DEVICE FOR SEPARATING SUSPENDED MATERIAL FROM A FLUID STREAM BY SPECIFIC GRAVITY DIFFERENCE

Kaichi Tanabe, Tondabayashi; Shigeto Koga, and Yoshinori Maeda, both of Kobe, all of Japan, assignors to Shinko-Pfaudler Company, Ltd., Kobe, Japan

Division of Ser. No. 830,697, Sep. 6, 1977, Pat. No. 4,122,017. This application Jul. 5, 1978, Ser. No. 921,900
Claims priority, application Japan, Dec. 28, 1976, 51/160692
Int. Cl.³ B23K *1/16;* B01B *23/06*
U.S. Cl. 228—182 **2 Claims**



1. A method of fabricating a tubular passage assembly, which comprises the steps of

(a) forming a plurality of corrugated sheets, each having a series of alternating large and small corrugations,

(b) superposing said corrugated sheets one over another so as to dispose each backside of large corrugations of an upper sheet in contact with a corresponding small corrugation of a lower sheet,

(c) jointing each contacting portion of said backside of large corrugations of the upper sheet and said small corrugations of the lower sheet by adhesive fixing means to fabricate the tubular passage assembly, and jointing a plurality of said tubular passage assemblies in crosswise direction by

(d) disposing the side end of a second alternate corrugated sheet layer in a superposed assembly more inwardly with respect to the axis of the assembly than the side end of a first alternate sheet layer by the sum of half a pitch of large corrugation and half a pitch of small corrugation,

(e) bringing the side ends of a first assembly into alternate contact with the side ends of a second assembly so as to butt-joint one end of a first sheet layer of said first assembly with the end of a second sheet layer of said second assembly, and likewise to butt-joint the end of a second sheet layer of said first assembly with the end of the first sheet layer of said second assembly, and

(f) jointing each contacting portion of the first assembly and the second assembly by adhesive fixing means for jointing the tubular passage assemblies in crosswise direction.

4,228,944

METHOD OF BONDING SUBSTRATES MADE OF METAL OR ALLOY

Minoru Inamura; Noboru Takeuchi; Kazuhiro Inukai; Kentaro Taninouchi, and Shin Utsunomiya, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

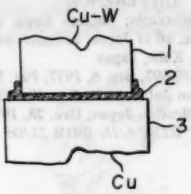
Filed Oct. 24, 1978, Ser. No. 954,284
Claims priority, application Japan, Oct. 31, 1977, 52/131139
Int. Cl.³ B23K *1/04, 25/00*
U.S. Cl. 228—198 **9 Claims**

1. A method of bonding metal or metal alloy substrates in air, comprising:

coating a solid brazing flux containing a powdered metal or powdered metal compound onto the surface of said substrates having a melting point greater than 700° C.; and

heating said coated substrates to a temperature greater than the melting point of the flux but less than the melting point

of the powdered metal or powdered metal compound, whereby molten crystallization and mutual diffusion occurs between metal of the surfaces of the substrates and the activated metal derived from the powdered metal or powdered metal compound containing flux.

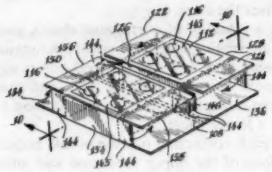


4,228,945

FOOD CARTON FOR MICROWAVE HEATING

Lawrence S. Wysocki, Chicago, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 5, 1979, Ser. No. 17,603
Int. Cl.³ B65D *5/20*
U.S. Cl. 229—30 **4 Claims**



1. A two part severable carton having venting apertures therein comprising:

first and second bottom panels each having a plurality of spaced tabs formed integrally therein, each of said tabs being defined by spaced cut lines to facilitate the removal of said tabs;

a strip of film secured to the undersurface of each said bottom panel by an adhesive applied to the bottom face of each said tab, said strip being secured in a manner to permit its removal from said bottom panels while remaining adhered to said tabs to thereby remove said tabs from said bottom panels to define venting apertures therein;

a pair of opposed first side wall panels hingedly connected to each said bottom panel and extending upwardly therefrom;

a pair of opposed end wall panels hingedly connected to the free edges of each said bottom panel and extending upwardly therefrom, with one of said end wall panels associated with each bottom panel being disposed in face to face abutting relationship and being adhesively connected at discrete locations therebetween;

a common top panel extending over both said bottom panels and being disposed parallel thereto, said top panel being hingedly connected to the top edge of the other said end wall panels;

a pair of opposed, common second side wall panels hingedly connected to the free side edges of said common top panel and extending downwardly therefrom, said second wall panels being disposed outwardly of said first side wall panels and being adhesively secured thereto, said second side wall panels extending below the plane of said bottom panels to support said bottom panels in spaced relation to a surface upon which said carton is placed; and

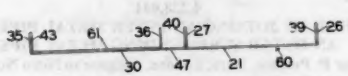
said top and second side panels including a continuous line of perforation, said perforated line being disposed perpendicular to the hinged connection between said top and second side panels and lying in a plane coincident with the plane between said adhesively secured end wall panels whereby said carton may be separated into two individual parts by severing said line of perforation and breaking said adhesive connection between said one end wall panels thereby enabling the separation of said parts of said carton.

4,228,946

CARTON

Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 750,396, Dec. 14, 1976, Pat. No. 4,144,996.
This application Jan. 2, 1979, Ser. No. 154
Int. Cl.³ B65D *5/22*
U.S. Cl. 229—33 **2 Claims**



1. A unitary carton blank for forming a carton having a reclosable cover portion hingedly nestable over a receptacle portion, said blank comprising:

(a) a bottom panel having a front edge, rear edge, and a pair of side edges;

(b) a front receptacle wall, rear receptacle wall, and a pair of side receptacle walls hingedly connected to said bottom panel along the front, rear, and side edges respectively of said bottom panel;

(c) a top panel having a front edge, rear edge and a pair of side edges;

(d) a front cover wall and a pair of side cover walls hingedly connected to said top panel along the front and side edges respectively of said top panel;

(e) a front cover flap hingedly connected to said front cover wall opposite said top panel;

(f) an inner top flap hingedly connected to said front cover flap opposite said front cover wall for underlaying said top panel;

(g) a rear cover wall hingedly connected to said inner top flap opposite said front cover flap;

(h) a rear receptacle flap hingedly connected to said rear receptacle wall opposite said front cover wall; and

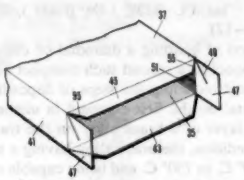
(i) a rear hinge panel hingedly connected to said rear receptacle flap opposite said rear receptacle wall and to said top panel opposite said front cover wall.

4,228,947

SELF-SECURING BOX CONSTRUCTION

Gary Eroyan, 1314 N. Crawford St., Detroit, Mich. 48209

Filed Apr. 16, 1979, Ser. No. 30,012
Int. Cl.³ B65D *5/10, 65/12, 65/14*
U.S. Cl. 229—39 R **13 Claims**



1. A self-securing box formed from a blank, cut, scored, folded and secured to define an open ended tube having a top with foldable outer end flaps, a bottom with foldable inner end flaps and sides with foldable end tabs;

each of the tabs adjacent the outer end flaps having an acute angular edge portion therein;

the respective tabs, inner flaps and outer flaps at opposite ends of the tube being folded successively through 90

degrees into engaging registry;

the sides of the outer flaps defining lock edges inclined at an acute angle to normally overlap said tab edge portions and adapted for manual flexing interlocking inward projection respectively, so as to retainingly engage interior portions of the adjacent tabs at said edge portion, each outer flap retainingly engaging an inner flap, the opposed tabs at opposite ends of the tube being innermost, the inner end flaps overlying and retainingly engaging said tabs, and the outer end flaps having their lock edges outwardly of the inner end flaps.

4,228,948

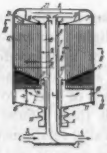
CENTRIFUGAL LIQUID CLEANER

Viktor A. Berber, Shelkovichnaya ulitsa, 184, kv. 65; Nikolai A. Khodosov, Oktyabrsky poselok, 6 linia, 36; Stanislav A. Kosygin, Shelkovichnaya ulitsa, 180, kv. 17; Vladimir I. Mozyakov, Shelkovichnaya ulitsa, 190, kv. 47, and Igor M. Lapshev, ulitsa 20 let VLKSM, 21, kv. 13, all of Saratov, U.S.S.R.

Filed Jun. 5, 1978, Ser. No. 912,178

Int. Cl.[2] B04B *11/06*

U.S. Cl. 233—3 **1 Claim**



1. A centrifugal liquid cleaner comprising: a base; a vertical hollow axle fixed rigidly on said base and provided with an inlet for the incoming liquid and an outlet for the cleaned liquid; a cylindrical rotor mounted rotatably on said hollow axle; a rotation drive of said cylindrical rotor; said cylindrical rotor comprising a bushing arranged coaxially with said hollow axle, a band secured at one end on said bushing and wound in a helix, spacers located radially one after another between the adjacent turns of the helix of said band, parallel with said hollow axle, gaps for the passage of the liquid, formed by said spacers and said band; one impeller located at the lower end of said bushing and connected to it for joint rotation, another impeller located at the upper end of said bushing and connected with it for joint rotation, each said impeller consisting of a disc and ribs secured on said disc at equal angular distances, said spacers secured by their edges in the ribs of said two impellers; discs of said impellers made and secured in such a manner that the distance between each disc and the corresponding edge of the helix of said band satisfies the condition:

$$\frac{l_1}{l_2} = \frac{R^3 - r^3}{r^3 - r_0^3}$$

where:

l_1 = distance between the disc of one of said impellers and the corresponding edge of the band helix;

l_2 = distance between the disc of the other one of said impellers and the corresponding edge of the band helix;

R = maximum radius of the helix of said band;

r = current radius of the helix of said band;

r_0 = minimum radius of the helix of said band;

such an arrangement of said discs relative to the edges of the helix of said band ensuring an optimum distribution of liquid flow velocities in said gaps, a casing connected with said two impellers, enclosing said bushing with the band and, both impellers and chambers which are located between the ends of said bushing with said band and said two impellers and communicate, respectively, with the liquid inlet and outlet in said hollow axle, said chambers communicating with each other through said gaps, a pressure disc mounted in said casing on said hollow axle above the other impeller.

4,228,949

SOLID BOWL SCROLL DISCHARGE DECANTER CENTRIFUGES

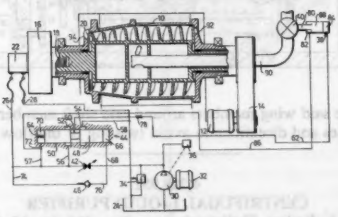
Joseph F. Jackson, Huddersfield, England, assignor to Thomas Broadbent & Sons Limited, Huddersfield, England

Filed Oct. 3, 1978, Ser. No. 948,274

Claims priority, application United Kingdom, Oct. 4, 1977, 41143/77

Int. Cl.[2] B04B *1/20, 9/10, 11/04*

U.S. Cl. 233—7 **7 Claims**



1. In a solid bowl decanter centrifuge comprising a solid, generally cylindrical bowl having a liquids outlet at one end and a solids outlet at the other end, means for rotating the bowl at a first speed, inlet pipework for introducing influent to the interior of the bowl, a feed valve in said inlet pipework for controlling the rate of flow of influent therethrough, a scroll conveyor mounted for rotation within the bowl at a second speed, a hydraulic motor whose body is connected to the bowl and whose output shaft is connected to the scroll conveyor whereby the motor speed determines the differential speed of the conveyor relative to the bowl, a hydraulic drive system for the hydraulic motor which includes a pump for supplying hydraulic fluid to the motor, and a primary control system adapted to monitor the hydraulic pressure in the hydraulic drive system for the hydraulic motor and to regulate the displacement of the pump so as to maintain a predetermined relationship between conveyor speed and the pressure in the hydraulic drive and hence between the conveyor speed and the conveying torque, the improvement comprising a secondary control system which is adapted to respond to the flow rate in the hydraulic drive of the motor to control the feed valve opening state such as to maintain the flow rate in the hydraulic drive, and hence the conveyor speed and the rate of discharge of solid material, at a substantially constant predetermined value.

4,228,950

HORIZONTAL FLOW-THROUGH COIL PLANET CENTRIFUGE

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

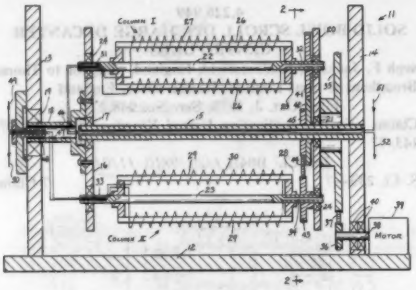
Filed Dec. 4, 1978, Ser. No. 966,329

Int. Cl.[3] B04B *9/08*

U.S. Cl. 233—25 **15 Claims**

1. A horizontal flow-through coil planet centrifuge apparatus comprising a support, a stationary shaft member horizontally rigidly mounted in said support, a pair of spaced parallel wing members, means rotatably supporting said wing members on said shaft member perpendicularly thereto, respective horizontal separation column assemblies journalled respectively for independent, planetary motions between portions of said wing members located on opposite sides of said shaft member, respective inlet and outlet flow tubes connected to each of said column assemblies to define flow paths therethrough, and

means to simultaneously rotate said column assemblies around their rotational axes relative to said wing members and to



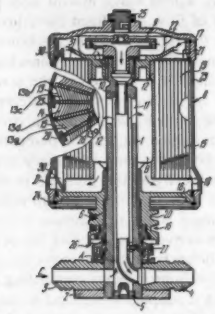
revolve said wing members around said shaft member at relative rates and directions to avoid twisting of the flow tubes.

4,228,951

CENTRIFUGAL LIQUID PURIFIER

Viktor A. Berber, Shelkovichnaya ulitsa, 184, kv. 65, Saratov, U.S.S.R.

Filed May 26, 1978, Ser. No. 909,976
Claims priority, application U.S.S.R., Jun. 20, 1977, 2489796
Int. Cl.[2] B04B *11/06*
U.S. Cl. 233—31 **8 Claims**



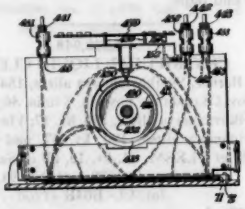
1. A centrifugal liquid purifier comprising: a base; a vertically extending hollow axle fixed on said base and having an inlet for the liquid to be purified and an outlet for the purified liquid; a cylindrical rotor mounted on said hollow axle with a possibility of rotation about the latter; a drive for rotating said cylindrical rotor; said cylindrical rotor including a top impeller and a bottom impeller, arranged at the opposite ends of said hollow axis, a bushing arranged coaxially with said hollow axis between said top and bottom impellers and coupled with said impellers for joint rotation, a band attached with its one end to said bushing and spiral-like wound thereon, said band being made crimped with crimps running parallel with said hollow axle, spacers located one after another in a radial direction between adjacent turns of said band spiral form in parallel with said hollow axle in crimp tops of said band to form radial rows, slit passages for the liquid being purified defined by said spacers and said band; a casing coupled with said top and said bottom impellers and designed to cover said bushing with said band, top and bottom impellers, spaces in said casing located between the ends of said bushing with said band and said top and bottom impellers and communicated one with the inlet and the other one with the outlet of said hollow axle, said spaces communicated with each other via said slit passages, and a pressure disk being mounted in said casing on said hollow axis above the top one of said impellers and designed for pumping the liquid.

4,228,952

AUTOMATIC MARK READING

Charles W. Britton, 30 Laurel Hill Rd., Cherry Hill, N.J. 08003

Filed Apr. 9, 1976, Ser. No. 675,628
Int. Cl.[3] G06K *7/14, 13/00*
U.S. Cl. 235—473 **14 Claims**



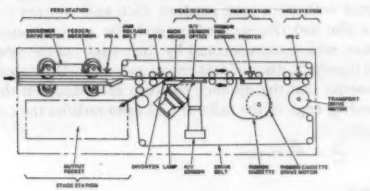
1. An automatic reading assembly for pencil-marked sheets, said assembly having a light-fiber line-to-circle converter that contains a packed line of light-conducting fibers, the pack merging from said linear array to a generally circular array, the linear array being the ends of 4 to 5 rows of fibers each about two to about three mils thick whose terminal portions are packed in contiguous parallel relationship, means for moving a sheet to be read across the sight of said line of rows, and means for scanning the generally circularly arrayed ends of said rows of fibers with a single stationary light-responsive cell to determine whether light from the sheet is momentarily diminished by a pencil mark that interferes with the light passing into the scanning means.

4,228,953

DUAL BELT DRIVE

James R. Ingram, Jr., Dallas, and George A. Kiesel, Irving, both of Tex., assignors to Recognition Equipment Inc.

Filed Nov. 13, 1978, Ser. No. 960,209
Int. Cl.[2] G06K *13/07, 13/18;* B65G *47/24*
U.S. Cl. 235—480 **4 Claims**



1. A reversible document transport wherein gear tooth type drive belts are used to engage each other and a document while the document is carried in a first then a second direction in the transport path past processing stations, comprising: a drive belt, an idler belt, first and second roller sets and a reversible drive means, said drive belt extending around said first roller set and driven by one roller which is attached to said drive means, said idler belt extending around said second roller set and having the gear teeth thereon engaging similar gear teeth on the drive belt, some of the rollers of the second roller set being spring biased holding the idler belt in contact with the drive belt and the document which is carried between the drive and idler belts maintaining the document in a fixed indexed position while it is moving from one processing station

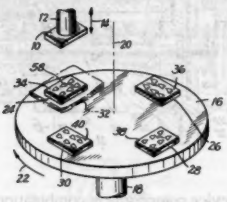
to another and until it is removed from the transport path while traveling in said second direction.

4,228,954

TEXTILE ARTICLE

William Rosenzweig, New York, N.Y., assignor to Fashion Ribbon Company Inc., New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,876
Int. Cl.[2] B32B 7/00
U.S. Cl. 239—60 18 Claims



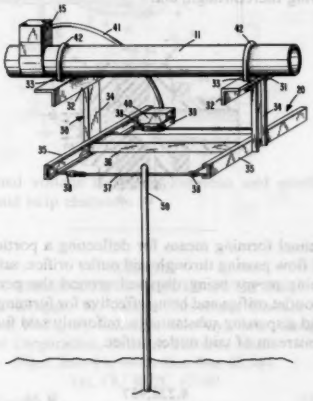
1. A method of making a shaped unitary composite puffy scented textile article which comprises providing a sealing die plate and a negative die plate, each of said die plates having at least one cavity, said negative die plate matching said sealing die plate and having a mating cavity smaller in overall size than that of said sealing die plate, said sealing die plate having a peripheral steel rule die about its cavity, said steel rule die being in the shape of the periphery of the textile article, said sealing die plate having an inner spring-loaded brass die parallel and adjacent to and within said steel rule die, said brass die normally extending out beyond the edge of said steel rule die, providing a flat planar sheet of insulating material, cutting a pattern from said sheet of insulating material, said pattern including an opening having the same shape and size as the cavity in said negative die plate, securing said sheet of insulating material to said negative die plate so that said pattern cannot shift, with the opening in said sheet of insulating material being in registration with the cavity in said negative die plate, disposing said sealing die plate and said negative die plate in juxtaposed registration, with the insulating sheet-covered side of said negative die plate facing said sealing die plate, inserting between the registered sealing die plate and negative die plate, successively and in planar parallelism, a first layer of gas-permeable cloth, a plurality of planar plies of spongy resilient filler, at least one fragrance pill, said pill being disposed between said plies, at least one sheet of a thermally activatable bonding agent, and a second layer of gas-permeable cloth, all of said layers, plies and sheet overlapping and coinciding and being larger than and extending beyond the area defined by said steel rule die, moving said sealing die plate and said negative die plate from a juxtaposed position to a contiguous position relative to each other for a finite time interval, generating an elevated temperature during at least a finite portion of said finite time interval by means of a radio frequency generator juxtaposed with said sealing die plate and opposite to said negative die plate, so that peripheral sealing and bonding of said layers and interposed bonding agent sheet and plies takes place in a sealed and bonded peripheral zone, said insulating material sheet serving to insulate and to prove radio frequency return during said finite portion of said finite time interval, exerting a force against said sealing die plate toward said negative die plate, said negative die plate being fixed, so that said brass die is retracted into said sealing die plate and said steel rule die cuts the textile article away from peripheral material about said sealed and bonded zone, and removing the resulting textile article from between said sealing die plate and said negative die plate.

4,228,955

SAFETY DEVICE FOR MOBILE IRRIGATION ASSEMBLIES

Loyal F. Petersen, P.O. Box 207, Osmond, Nebr. 68765

Filed Jul. 2, 1979, Ser. No. 54,095
Int. Cl.[3] B05B 3/00
U.S. Cl. 239—177 2 Claims



1. A safety device for a mobile irrigation assembly having a plurality of pipe segments which are movably mounted for rotation about a pivot point by a drive mechanism wherein the safety device comprises

a framework, selectively disposed on one of said plurality of pipe segments, and comprising at least two end pieces connected by a horizontally disposed elongated support member,

each of said end pieces composed of a mounting bracket having at least one downwardly depending member, and an elongated bottom portion which projects perpendicular to, and substantially beyond, the sides of said pipe segment,

a switch element mounted on the framework and operatively connected to the drive mechanism

a flexible member operatively connected to the switch element, and suspended between and supported by the elongated bottom portions of the end pieces, and

a separate elongated ground engageable member whose length is dimensioned so as to engage the flexible member at a point in the arc of rotation of said one of said plurality of pipe segments during movement of the mobile irrigation assembly whereby the ground engageable member will deform the flexible member to actuate the switch to disengage the drive mechanism.

4,228,956

IRRIGATION SYSTEM AND FLUID DISPERSION NOZZLE

James P. Varner, Hanover Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 879,556, Feb. 21, 1978, abandoned. This application Nov. 30, 1978, Ser. No. 965,221
Int. Cl.[3] B05B 1/30, 1/34, 3/04
U.S. Cl. 239—237 14 Claims

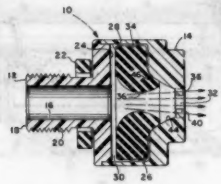
1. A nozzle device for controlling the dispersion of a pressurized supply of fluid, comprising:

(a) housing means defining an inlet passage and a control chamber downstream from said inlet passage and further defining an outlet orifice located downstream from said control chamber and substantially aligned with said inlet passage in the direction of flow;

(b) flow control means disposed in said control chamber,

said flow control means having a control orifice therein for limiting the fluid flow rate therethrough, said control orifice being effective for guiding said flow to an outwardly projecting fluid stream;

(c) said outlet orifice having an internal transverse dimension greater than the periphery of said fluid stream such that said fluid stream is substantially unobstructed while flowing therethrough; and



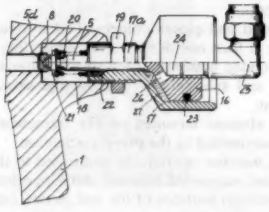
(d) channel forming means for deflecting a portion of said fluid flow passing through said outlet orifice, said channel forming means being disposed around the periphery of said outlet orifice and being effective for forming channels in and dispersing substantially uniformly said fluid stream downstream of said outlet orifice.

4,228,957

SPRAY GUN

Giorgio Davini, Milan, Italy, assignor to Basfer S.R.L., Milan, Italy

Filed Apr. 10, 1978, Ser. No. 895,087
Int. Cl.³ B05B 1/28
U.S. Cl. 239—300 **2 Claims**



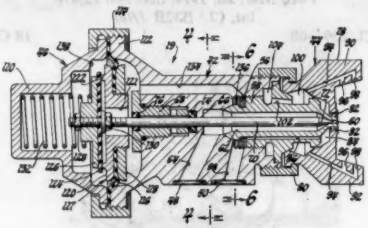
1. A spray gun comprising: a body having a threaded hole, a nozzle in said body for spraying paint and the like; a pair of oppositely located nozzles for sending jets of compressed air to the sides of a spray cone in order to flatten and fan it out; a control valve for controlling supply of compressed air to the said pair of nozzles, a valve element in said control valve, a movable rod fixed to the valve element that reciprocates from a position closing the control valve and corresponding to cone spraying, to an open position, corresponding to fan spraying, an adjustable limit device determining the open position; pneumatic means, of the single acting type, to alternately displace said movable rod into one or the other of the said positions, said pneumatic means comprising a cylindrical jacket of a cup-shaped configuration having a narrower, tubular structure, extension piece adjustably screwed into said threaded hole provided in the body of the gun, a piston provided with an axial hole communicating with a connection for the supply of compressed air, said jacket and said piston defining a chamber therebetween, said hole in said piston communicating moreover, via a passage machined into the same piston, with said chamber formed between said cylindrical jacket and said piston; and said piston being a differential area type piston having a larger area on a downstream face thereof.

4,228,958

AIR-OPERATED SPRAY DEVICE

James C. Perry, Almont, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 27, 1979, Ser. No. 61,506
Int. Cl.³ B05B 7/04
U.S. Cl. 239—411 **3 Claims**



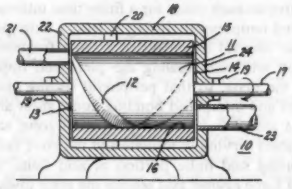
1. A spray device comprising in combination a body member including a nozzle at one end thereof, said nozzle having an orifice formed therein, a pressure chamber formed in the other end of the body member, a first passage for sprayable liquid located in said body member and leading to said orifice in the nozzle, an axially movable needle valve in said first passage, one end of said needle valve adapted to open and close said orifice, the other end of said needle valve extending into said pressure chamber and having a support member connected thereto, a spring in said pressure chamber contacting said support member and urging said needle valve to a closed position, a source of pressurized air at a predetermined pressure, said body member having a second passage formed therein for simultaneously connecting said source of pressurized air to said pressure chamber and to said nozzle for atomizing the liquid as it flows through the orifice, and a flexible member in said pressure chamber cooperating with said support member for allowing pressurized air to flow from said second passage into said pressure chamber and thereby augment the force of said spring so as to maintain a closing force on said needle valve that is substantially equal to but less than the force required to open the needle valve whereby said needle valve will not open to allow the sprayable liquid to flow to the orifice in the nozzle until the pressurized air is at a pressure sufficient to atomize said sprayable liquid.

4,228,959

ROTATING NOZZLE EXPANDER

Bahram Keramati, and Vedanth Kadambi, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,587
Int. Cl.² B05B 1/32
U.S. Cl. 239—451 **5 Claims**



1. A rotating nozzle expander comprising a rotor, the rotor having a groove along its length, the rotor groove size changing from one end of the groove to the other end, a sleeve encasing the rotor thereby defining a fluid flow passage, a housing, fluid inlet means for the housing, fluid outlet means

for the housing, the rotor and associated sleeve rotatably mounted with the housing, the rotor groove inlet in communication with the fluid inlet means, and the rotor groove outlet in communication with the fluid outlet means.

4,228,960

LIQUID FUEL INJECTORS

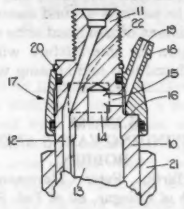
Dorian F. Mowbray, Burnham, and Stephen Edwards, Sible Hedingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 30, 1978, Ser. No. 938,022

Claims priority, application United Kingdom, Sep. 9, 1977, 37681/77

Int. Cl.³ F02M *61/20*

U.S. Cl. 239—533.9 **10 Claims**



1. A liquid fuel injector of the kind which in use, is intended to be mounted on an internal combustion engine at a position to direct fuel into a combustion space of the engine, the injector comprising an elongated body part having a liquid fuel inlet at or adjacent one end thereof and an outlet orifice at or adjacent the other end, a valve member slidably mounted within a bore defined in the body part, resilient means acting on the valve member to urge the valve member into contact with a seating thereby to prevent flow of fuel through said orifice, a surface defined on the valve member and against which fuel under pressure can act to lift the valve member from the seating thereby to allow fuel flow through the orifice, an outlet for fuel leaking between the valve member and the bore, said outlet breaking out onto the periphery of the body part at a position adjacent said fuel inlet, a collar surrounding the body part and defining with the body part a cavity into which fuel can flow from said outlet, said collar having formed integrally therewith a nipple or nipples in which is formed a flow passage or flow passages in communication with said cavity, a circlip engageable within a groove within the body part to hold the collar in assembly with the body part, and a pair of sealing means to prevent the escape of fuel from the cavity other than through said flow passage or passages.

4,228,961

ELECTROSTATIC POWER PAINTING HEAD

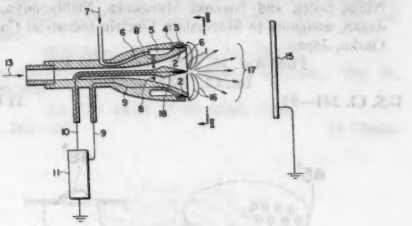
Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Co., Ltd., Onoda, Japan

Filed May 7, 1979, Ser. No. 36,282

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—698 **8 Claims**

1. An electrostatic powder painting head characterized in that said head comprises a powder ejection port made of insulator, a needle electrode disposed in the proximity of said powder ejection port, a strip electrode disposed outside of said powder ejection port, and a gas ejection port for forming a gas flow layer along the surface of said strip electrode, and a



predetermined voltage is applied between said needle electrode and said strip electrode.

4,228,962

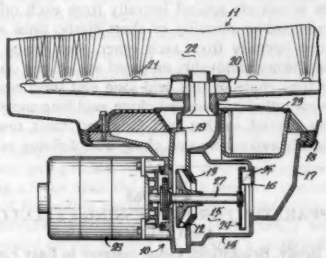
COMMINUTING LIQUID SWIRLER

Geoffrey L. Dingler, St. Joseph Township, Berrien County, Mich., and Philip P. Johnson, Conway, Ark., assignors to Whirlpool Corporation, Belmont Harbor, Mich.

Filed Jun. 14, 1979, Ser. No. 48,444

Int. Cl.³ B02C *18/40*

U.S. Cl. 241—46 R **12 Claims**



1. In a dishwasher having a pump for supplying washing liquid to a spray system for cleaning dishes and a centrifugal separator for separating particles from the washing liquid as said liquid passes from said spray system to said pump, swirling and chopping means for causing swirling movement of the liquid being flowed through said flow passage and chopping of solids carried by the liquid, said swirling and chopping means comprising:

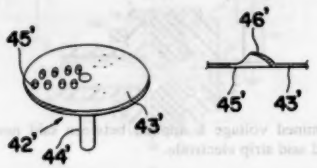
a wall member having distributed through openings for passing the liquid being flowed, and means for rotating the wall member about an axis parallel to the longitudinal extent of the flow passage for causing the portions of the wall member defining the edges of the openings to comprise means for chopping and thereby comminuting large solids carried in the liquid to a small enough size to permit passage thereof through said openings with said liquid; and

holding means adjacent the wall member for preventing unchopped large solids caught on the upstream portion of the wall member from being carried therewith thereby to prevent clogging of the openings by said large solids, said holding means further cooperating with the wall member for causing chopping of the large solids and thereby effectively assuring comminuting action by the wall member on substantially all large solids for maintained swirling of the liquid in the flow passage.

4,228,963
RECEPTACLE FOR MOTOR-DRIVEN FOOD PROCESSOR

Terukazu Yamauchi, Mino; Katsufumi Nishio, Toyonaka; Fusao Niino, Suita, and Toyoaki Murasawa, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 26, 1979, Ser. No. 33,410
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—92 **11 Claims**



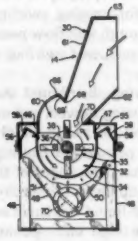
1. A tilt preventing means for use in a food processor of the type which has an electric motor with a drive shaft, a removable receptacle which includes a container and a lid with the lid having an upwardly extending wall which defines a feed chute which connects the exterior at one open end of the chute with the interior of the receptacle at a second end when it is mounted on the container, and a rotary treating element which is caused to rotate at a high speed within the receptacle by the drive shaft, said tilt preventing means comprising:

an elastic retaining means having a plurality of long elastic tines which are spaced laterally from each other and a corresponding plurality of short elastic tines which are spaced laterally from each other, said elastic retaining means being removably mounted at said one open end of said feed chute so that said long and short tines extend downwardly into said feed chute, said long and short tines being curved so that said long and short tines extend inwardly away from said chute wall defining said chute.

4,228,964
APPARATUS FOR PROCESSING CELLULOSE INSULATION

John H. Brady, Broomfield, Colo., assignor to Easy Engineering Corporation, Broomfield, Colo.

Filed May 8, 1978, Ser. No. 903,685
Int. Cl.³ B02C *13/284, 13/282*
U.S. Cl. 241—186.3 **10 Claims**



1. In apparatus for grinding and pulverizing cellulose materials and the like wherein an outer frame supports a grinder housing, said grinder housing defined by an outer semicylindrical housing wall provided with discharge openings to permit removal of pulverized materials less than a predetermined size from said housing wall, said frame providing an upper inlet opening above said sidewalls, and grinding means having rotary beater elements is disposed within said housing wall for grinding and pulverizing materials coming into contact therewith into a predetermined size for removal through said discharge openings, the improvement comprising:

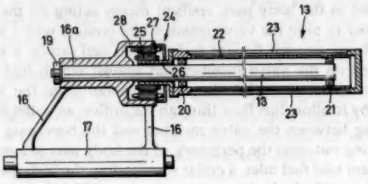
(i) feed inlet means for introducing unground materials through said upper inlet opening into communication with the interior of said housing wall, said feed inlet means having opposite, downwardly convergent sidewall portions terminating in a throat region spaced above said upper inlet opening; and

(ii) reverse flow means defined by a generally arcuate-shaped hood diverging away from one of said sidewall portions at said throat region of said feed inlet means and extending downwardly toward one wall of said housing wall, said hood disposed on the side of said housing wall in the direction of rotation of said beater elements, said reverse flow means forming a relatively low pressure area with respect to the air pressure within said housing wall whereby to encourage reverse flow of partially ground materials not sufficiently small enough to pass through said discharge openings in a direction counter to the movement of the unground materials through said feed inlet means, and deflector means on said hood being operative to cause the partially ground materials flowing into the low pressure area of said hood to be reintroduced into said throat region for intermixture with the unground materials introduced into said housing wall.

4,228,965
ASSEMBLY FOR WINDING YARNS AND THE LIKE ON A BOBBIN

Richard Heim, Hürth; Peter Hermanns, and Alfred Tschentscher, both of Cologne, all of Fed. Rep. of Germany, assignors to FMN Schuster GmbH & Co. KG, Hürth, Fed. Rep. of Germany

Filed May 30, 1979, Ser. No. 43,854
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825183
Int. Cl.³ B65H *54/40, 59/00*
U.S. Cl. 242—45 **5 Claims**



1. An assembly for winding yarn on a thread package, especially synthetic threads, on to a bobbin or bobbin tube carried on a mandrel, said assembly comprising:

(a) the mandrel including a frame portion and a mandrel tube mounted to rotate on bearing means located on a stationary axle fixed to the frame portion,

(b) said bearing means includes two bearings laterally spaced with respect to each other on said stationary axle to rotatably support said mandrel tube,

(c) electrically operated friction drive means driving the mandrel tube which carries the bobbin tube and the thread package, and

(d) electrically operated axial drive means for directly rotating the mandrel tube which includes a tube attachment at one end thereof,

(e) said friction drive means and said axial drive means being effective to operate in tandem,

(f) the axial drive means includes a three-phase a.c. motor having a stator and a rotor with the rotor rigidly disposed on the tube attachment,

(g) said mandrel frame portion includes a casing part overlapping the tube attachment with the stator of the three-phase motor being disposed therein around said rotor.

4,228,966

SATELLITE REEL

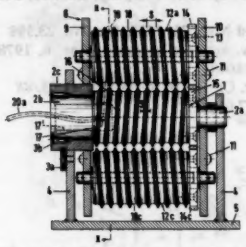
Hendrik M. W. Croese, Vlaardingen, Netherlands, assignor to Ir. H.M.W. Croese Raadgevend, Vlaardingen, Netherlands

Filed Aug. 2, 1979, Ser. No. 62,938

Claims priority, application Netherlands, Jan. 25, 1979, 7900609

Int. Cl.[3] B65H *75/00*

U.S. Cl. 242—54 R 2 Claims



1. A storage reel for provisionally receiving a variable cable length between a stationary end and a movable end of the cable, characterized by a central drum which is stationary mounted and is fitted with a cable-receiving groove extending helically over the drum surface, with a connection to an axial cable passage for a stationary cable end, and at least two satellite drums, each having the same diameter as the central drum and each likewise being fitted in its drum surface with a helical cable-receiving groove of the same pitch as that of the central drum, however oppositely directed with respect to the pitch of the central drum, said satellite drums being rotatable about the central drum and simultaneously about their own axes, such that the oppositely disposed portions of the respective grooves take up a portion of the cable between them.

4,228,967

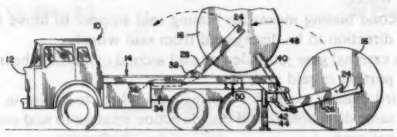
REEL LOADER CONSTRUCTION

Roger D. Woodruff, Hebron, Ind., assignor to Champion Corporation, Hammond, Ind.

Filed Sep. 19, 1979, Ser. No. 76,832

Int. Cl.[3] B65H *19/20*

U.S. Cl. 242—86.5 R 10 Claims



1. In a reel loader apparatus comprising a mechanism for loading reels onto a supporting bed and for unloading the reels, the reels comprising a center section for holding cable and side flange sections, each flange section defining a rim engageable with said bed, the improvement comprising reel drive means for rotating a reel about its horizontal axis, rim engaging means defined by said drive means, means supporting said drive means on said bed whereby at least one rim of a reel located on the bed engages a rim engaging means, and motive power means for said drive means, said motive power means being adapted to operate the drive means in either direction whereby cable can be fed from or driven onto a reel, and means associated with said motive power means for varying the pressure applied by said rim to said drive means for thereby varying the driving force of said drive means.

4,228,968

REEL FOR AUTOMATIC SAFETY BELTS FOR VEHICLES, ESPECIALLY MOTOR VEHICLES

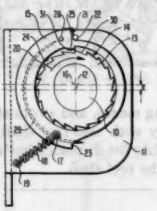
Walter Jahn, Ehningen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,276

Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822099

Int. Cl.[3] A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 13 Claims



1. A reel arrangement for automatic safety belts of motor vehicles, the arrangement including roller means for accommodating the safety belt rotatably mounted in a housing, spring means connected to the roller means for providing a force counteracting a withdrawal of the safety belt from the roller means, and means for automatically locking the roller means upon the safety belt being subjected to high belt forces, characterized in that a gear means is connected to the roller means so as to be rotatable therewith, a rotatably mounted drag disk means is eccentrically disposed with respect to said gear means so as to enable the gear means to rotate relative to the drag disk means in a belt extraction direction, said drag disk means including a bearing surface means for carrying an engagement means for engaging said gear means in a belt take-up direction, an additional spring means connected with the drag disk means for exerting a force upon the drag disk means in opposition to the force of the spring means connected to the roller means thereby providing a reduced tension in the safety belt, stop means provided on the housing for limiting a rotational movement of the drag disk means, two additional spaced stop means are provided on the drag disk means and are adapted to come into engagement with said stop means on the housing, curved control and guide track means provided on the housing, and in that a guide means is provided on the drag disk means and cooperates with the curved control and guide track means for guiding a rotational movement of the drag disk means.

4,228,969

DEVICE IN CONNECTION WITH REEL MECHANISMS FOR SAFETY BELTS FOR AUTOMOBILES

Gustav E. V. Svensson, Kolm, Sweden, assignor to Autoliv AB, Vargarda, Sweden

Filed Oct. 10, 1978, Ser. No. 949,677

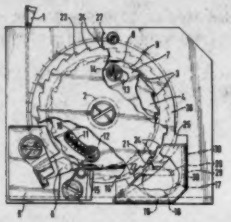
Claims priority, application Sweden, Oct. 12, 1977, 7711468

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A 6 Claims

1. Activation means for a safety belt for a vehicle wherein there is provided a reel shaft for winding up said belt, a stop mechanism for the reel shaft having a wheel with ratchet teeth thereon rotatable together with said shaft and a pawl for cooperating with said ratchet teeth, and connecting means operably connecting said activation means with said pawl, said activation means comprising a supporting means, a body of inertia located in said supporting means, and an operating member for cooperation with said body of inertia constituting one unit, said body of inertia having a neutral position in said supporting means and being displaced from said neutral position in response to an abnormal change in movement of the vehicle to

move said operating member and through said connecting means to actuate said pawl into engagement with one of said ratchet teeth, said activation means being located in a housing and being rotatable in said housing around a horizontal center



axis of the supporting means, and a rotatable ring shaped plate is mounted coaxially with said reel shaft, said housing being supported by said plate for displacement about a circle having the same center as the reel shaft.

4,228,970

SAFETY BELT RETRACTOR WITH EMERGENCY LOCKING MECHANISM

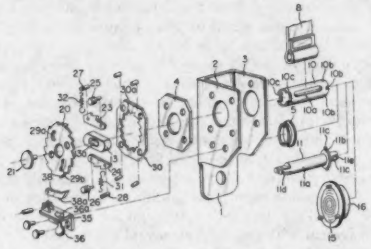
Masaru Morinaga, Yamato, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,508

Claims priority, application Japan, Jan. 6, 1978, 53/408; May 29, 1978, 53/63375

Int. Cl.[3] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **8 Claims**



1. An emergency locking mechanism for the webbing take-up shaft of a safety belt retractor for a motor vehicle comprising:

an inertia sensitive ratchet gear supported coaxially on the take-up shaft for rotation therewith in a normal state, but rotating relative to the take-up shaft due to its inertia when the webbing pay-out exceeds a predetermined rate;

a latch member pivotally supported on the ratchet gear and adapted to pivot outwardly from the center of rotation of the ratchet gear;

vehicle acceleration sensing means for sensing a predetermined speed change of the vehicle and having means for engaging the ratchet gear to arrest its rotation upon sensing said predetermined speed change to cause relative rotation between the ratchet gear and the take-up shaft when the take-up shaft rotates in response to webbing pay-out;

a fixed member attached to the retractor and adapted to be engaged by the latch member when the latch member pivots outwardly; and

an engaging member attached to the take-up shaft, the engaging member causing the latch member to pivot outwardly and engage the fixed member when the ratchet gear rotates relative to the take-up shaft, engagement between the latch member and the engaging member arresting the rotation of the take-up shaft when the latch member engages the fixed member.

4,228,971

SEAT BELT RETRACTOR WITH TENSION ELIMINATING MECHANISM

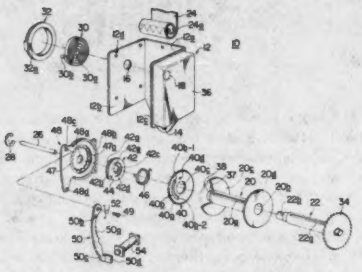
Tatsuhiro Arima, Fujisawa, and Chusaku Yamanashi, Kosai, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Fuji Kiko Company, Limited, Tokyo, both of, Japan

Filed Mar. 26, 1979, Ser. No. 23,598

Claims priority, application Japan, Apr. 6, 1978, 53/40485; Apr. 6, 1978, 53/40486

Int. Cl.[3] A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107.6 **6 Claims**



1. A belt retractor for a safety seat belt arrangement having a webbing, comprising:

a housing;

a reel rotatably mounted in said housing and winding thereon said webbing when said reel is rotated about the axis thereof in one direction, said reel being formed thereon with first and second cylindrical bearing portions which are respectively concentric and eccentric with respect to the longitudinal axis of said reel;

first biasing means for biasing said reel to rotate about the axis of the same in said one direction;

a wheel journaled on said first cylindrical bearing portion;

a stopper for stopping rotation of said wheel about the first cylindrical bearing portion when engaged with said wheel;

second biasing means for biasing said stopper to move in a direction to be disengaged from said wheel;

an external gear journaled on said second cylindrical bearing portion of said reel;

third biasing means for biasing said wheel to rotate in the same direction as said one direction relative to said external gear;

an internal gear stationarily connected to said housing at a position to be operatively engaged with the external gear;

memorizing means including at least one stud fixed to said external gear and at least one arcuate slot formed in said wheel, said stud being spacedly received in said slot and said arcuate slot being concentric with said first cylindrical bearing portion, said stud and said slot being so arranged and formed that when said stud is kept in contact with one longitudinal end of said slot under engagement of said stopper with said wheel, said external gear becomes fixed so as to be prevented from rotation relative to said internal gear; and

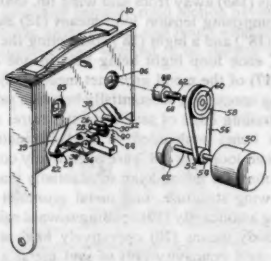
actuating means for causing said stopper to be brought into engagement with said wheel against the force of said second biasing means when said webbing takes the passenger restraining position.

4,228,972

WEB SUPPLY AND TAKE-UP SYSTEM

Eugene F. Koppensteiner, Niles, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 4, 1979, Ser. No. 36,193
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—201 7 Claims



1. In a web supply and take-up system wherein a web is transported by means of a capstan and pressure roller from a supply reel to a take-up reel and wherein the take-up reel is driven to wind up the web transported, the improvement comprising:

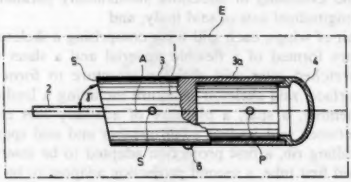
a friction roller placed between the supply and take-up reels comprising an outer cylindrical face to receive the web in frictional engagement, a fixed central post having a substantially flat portion affixed near one end, a pressure plate having at least one substantially flat surface in frictional contact with the flat portion of the fixed central post, spring means positioned internal to the outer cylindrical face for continuously urging the pressure plate against the flat portion, whereby the friction roller supplies a force counter to the take-up reel drive force to assist the capstan and pressure roller in stopping undesired web movement.

4,228,973

INFANTRY PROJECTILE

Peter Klein, Putzbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 2, 1975, Ser. No. 637,669
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1974, 2457503
Int. Cl.[3] F42B *15/18, 15/10, 13/00*
U.S. Cl. 244—3.1 10 Claims



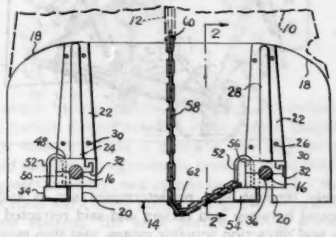
1. An infantry projectile for use against ground targets comprising an elongated projectile body having a longitudinal axis and said body being symmetrical about its longitudinal axis, said projectile body having a leading end and a trailing end each extending transversely of the longitudinal axis, the surface of said projectile body between the leading and trailing ends thereof in a plane extending perpendicularly of the longitudinal axis is concentric to the longitudinal axis, trimming means provided on the leading end of said projectile body, wherein the improvement comprises that said projectile body has a single flow-control projection extending outwardly from its concentric surface at a location intermediate the leading and trailing ends of the projectile body, said projection is arranged so that in a vertical plane of symmetry through the longitudinal axis of said projectile body with the vertical plane of symmetry determined by said trimming means said projection is located on the lower side of said projectile and the aerodynamic center of the projectile is located below the center of gravity of said projectile.

4,228,974

PROTECTIVE DEVICE FOR INSTRUMENTS AND LOCKING OF AIRCRAFT CONTROLS

August B. Yates, Orlando, Fla., assignor to J. Talmadge Webb, Satellite Beach, Fla.

Filed Feb. 15, 1979, Ser. No. 12,463
Int. Cl.[3] B64C *13/14;* B64D *47/00;* E05D *73/00*
U.S. Cl. 244—224 7 Claims



1. In an aircraft having an instrument panel and controls for ailerons and elevators, said controls including at least one column turned by a hand operated yoke and movable axially for controlling the ailerons and elevators respectively, a protective device for preventing theft of the aircraft instruments from said panel and preventing unauthorized flight removal of the aircraft from a parking area, said device comprising a protective instrument cover, and means for lockingly mounting said cover in a position immediately adjacent the aircraft instrument panel and to said at least one column in such manner as to prevent unauthorized movements of said at least one column and the ailerons and elevators controlled thereby, said means for lockingly mounting the cover comprises first and second complementary blocks which clamp about said at least one column to prevent its movements, said first block being fixed to said cover and the second block being separable from the first, and means for locking the blocks together.

4,228,975

KNEELING NOSE LANDING GEAR ASSEMBLY

Francis Sealey, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 29, 1979, Ser. No. 43,060
Int. Cl.[3] B64C *25/14*
U.S. Cl. 244—102 R 5 Claims

1. A kneeling nose landing gear assembly for an airplane having a fuselage frame comprising:

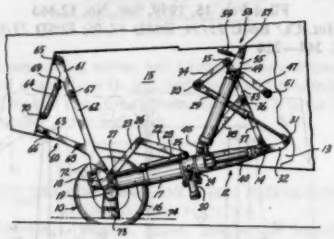
a landing gear strut having an upper and a lower end, means pivotably coupling said upper end of said strut to said fuselage frame for swinging movement between a retracted position within a wheel bay and an upright taxiing position wherein said strut extends downwardly from said airplane, said strut having wheel means journalled to said lower end of said strut;

retraction actuator means operatively coupled between said strut and said frame for selectively swinging said strut between said taxiing position and said retracted position;

kneeling actuator means having a first end and a second end, means coupling said first end of said kneeling actuator

means to said landing gear strut, idler arm means having a first end and a second end, said first end of said idler arm means being pivotably coupled to said frame of said airplane, means pivotably coupling said second end of said idler arm means to said second end of said kneeling actuator means, said second end of said kneeling actuator means being thereby constrained by said idler arm means to swing through a predetermined arc, and;

stop means operatively coupled to said frame of said airplane and movable between an operable position wherein said stop means is interposed in said predetermined arc for receiving said second end of said kneeling actuator means and an inoperable position wherein said stop means is removed from said predetermined arc thereby permitting said second end of said kneeling actuator means to swing



freely through said predetermined arc as said strut is moved between said taxiing and said retracted positions by said retraction actuator means, said stop means in said operable position and said kneeling actuator means being cooperable to support said strut in a kneeling position intermediate between said upright taxiing position and said retracted position, said kneeling actuator means being forcibly extensible against said stop means in said operable position and thereby operable to cushion the descent of the nose of the airplane as said strut is pivoted from said taxiing position into said kneeling position, said kneeling actuator means and said stop means being further cooperable to augment said retraction actuator means to raise the nose of the airplane by pivoting said strut from said kneeling position to said taxiing position.

4,228,976

MAIN CONNECTOR FOR AN AIRFOIL OR WING

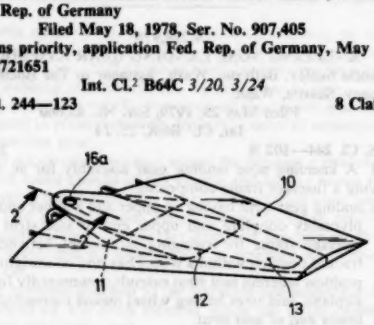
Max Eiselbrecher, Unterpfaffenhofen; Rolf Guenther, Munich, and Helmut Jakob, Zorneding, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,405

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721651

Int. Cl.[2] B64C *3/20, 3/24*

U.S. Cl. 244—123 **8 Claims**



1. A wing structure having a free end forming a wing tip and a connector end adapted to be connected to a craft, said wing structure further including a leading edge and a trailing edge, comprising a plurality of laminated layers (**14**) and connector means (**16**) secured to said connector end of said wing structure, said connector means comprising a connector bore (**16*c***) with a central axis (**16*b***) and metal grommet means (**15**) centered relative to said central axis (**16*b***), said metal grommet means (**15**) comprising a plurality of bearing recesses (**17**) arranged in radial succession at radii which increase from said central axis (**16*b***) away from said wing tip, said wing structure further comprising tension loop means (**18**) each having two loop legs (**18″**) and a bight (**18′**) connecting the respective two loop legs, each loop bight being held in one of said bearing recesses (**17**) of the metal grommet means (**15**), said loop legs (**18″**) being spread out substantially between said leading edge and said trailing edge of said wing structure, said spread out loop legs being embedded in said laminated layers (**14**) whereby said loop legs (**18″**) are operatively connected to said wing structure for introducing substantially tension loads only into said wing structure, said metal grommet means further comprising a concavity (**19**) opening toward said wing tip, and pressure body means (**20**) operatively held at one end (**20′**) thereof in said concavity (**19**) of said metal grommet means (**15**) and operatively connected to said wing structure between said loop legs (**18**) for introducing substantially pressure loads only into said wing structure.

4,228,977

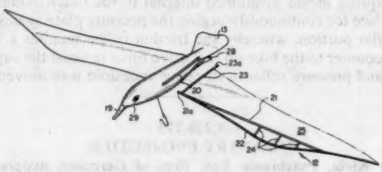
KITE

Yasuo Tanaka, 320 Oaza Murata, Washima-mura, Santo-gun, Niigata-ken, Japan

Filed Jan. 31, 1979, Ser. No. 8,333

Int. Cl.[3] B64C *31/06*

U.S. Cl. 244—153 R **7 Claims**



1. A kite comprising:

a longitudinally extending central body formed of a lightweight material;

a first tube extending through said body transversely of the longitudinal axis thereof;

a pair of second tubes disposed on opposite sides of said body and extending in directions substantially parallel to said longitudinal axis of said body; and

a pair of wings, each said wing comprising a skeleton structure formed of a flexible material and a sheet material stretched over said skeleton structure to form a wing surface, said skeleton structure including a leading edge member, a spar, a plurality of auxiliary ribs extending between said leading edge member and said spar, an installing rib, a first projection adapted to be inserted into said first tube, a second projection adapted to be inserted into a respective one of said second tubes, said first projection being provided at an inward end of said spar, and said second projection being provided at a rearward end of said installing rib.

4,228,978

RECREATIONAL VEHICLE SEWER HOSE SUPPORT

Roger Rand, 3810 N. Romero, Tucson, Ariz. 85705

Filed Oct. 16, 1978, Ser. No. 951,361

Int. Cl.[2] F16L *3/00*

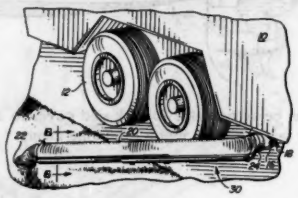
U.S. Cl. 248—49 **1 Claim**

1. A hose support device for supporting a flexible sewer hose

attached to an RV when discharging waste to a dumping location; said hose support comprising:

(a) a first generally elongate rigid section having a generally trough-like cross-section adapted to receive at least a portion of said hose; said first section having opposite first and second ends and being substantially free of any projections;

(b) a second generally elongate rigid section having a generally trough-like cross-section and being substantially free of any projections and adapted to be slidable relative to



said first section; said second section having opposite first and second ends;

(c) said first and second sections each defining at least one aperture extending therethrough which apertures may be selectively aligned;

(d) fastening means cooperative with said apertures for securing said sections together at a desired length; and

(e) flexible tie means associated with the first end of said first section and the second end of said second section whereby the support is engageable with said hose and securable thereabout as said ties adjacent both ends of said support.

4,228,979

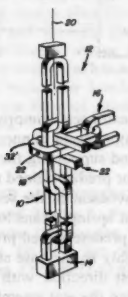
RIGID CHAIN SYSTEM FOR ARTICLES WITH COLUMN STRUCTURES

Marvin P. Lanphear, 2740 22nd St. La., Greely, Colo. 80631

Continuation-in-part of Ser. No. 616,878, Sep. 25, 1975, Pat. No. 4,135,689. This application Oct. 31, 1978, Ser. No. 956,993

Int. Cl.[2] F16M *11/20*

U.S. Cl. 248—188.1 **8 Claims**



1. In a load supporting article having a horizontal element interconnected between at least two rigid vertical columns, each of said columns having a plurality of chain-like link sections, adjacent ones of the link sections being aligned with perpendicular planes intersecting along a common column axis, each of the link sections comprising solid leg portions and bridging portions rigidly interconnecting the leg portions at opposite longitudinal ends thereof, the bridging portions of the adjacent link sections being formed by a single unitary piece of material, and coupling means holding the bridging portions in rigid assembled relation to the leg portions for alignment with said perpendicular planes.

4,228,980

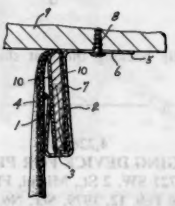
VALANCE HANGER BRACKET AND SYSTEM

Pierre Beauchamp, 3187 St. Charles St., St. Laurent, Canada (H4R 1B5), and Augusto Di Giacomo, 9338 Bruchesi, Montreal, Canada (H1Z 2P7)

Filed Nov. 9, 1978, Ser. No. 959,333

Int. Cl.[2] A47H *1/10*

U.S. Cl. 248—262 **4 Claims**



1. A curtain hanger system comprising, in combination, a ceiling, a curtain hanger bracket, a flat curtain hanger and a curtain or valance having a gusset at one edge portion, in which said flat bar is longitudinaly inserted and constituting a bar and gusset assembly, said curtain hanger bracket including a hook portion and a fixing portion integrally formed of a strip of resilient material, the hook portion having a transverse U-shape configuration including a transverse bottom portion and a front and a rear upright portion extending from the respective ends of said bottom portion, said fixing portion extending rearwardly from the upper end of said rear upright portion and at substantially right angle to said rear upright portion, said fixing portion being flat and fixed flat to said ceiling, said front upright portion being shorter than said rear upright portion and leaving between said ceiling and the upper end of said front upright portion a gap through which said bar and gusset assembly is inserted edgewise into said hook portion, said bar having a width slightly greater than the vertical distance between said ceiling and said bottom portion, said bar and gusset assembly inserted edgewise in said hook portion and having a lower edge resting on said bottom portion and a top edge bearing against said ceiling, said rear upright portion flexed rearwardly relative to said fixing portion, thereby inclined downwardly and rearwardly and biasing said bar and gusset assembly against said ceiling, said curtain or valance depending from the top edge of said bar and gusset assembly in front of said front upright portion and concealing said bracket.

4,228,981

ADJUSTING MECHANISM FOR THE SEAT OF AN AUTOMOTIVE VEHICLE

Hans Rampel, Eicha; Peter Hess, and Volkmar Schulz, both of Coburg, all of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,503

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713693

Int. Cl.[2] F16M *13/00*

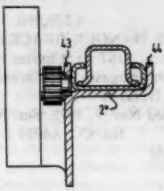
U.S. Cl. 248—430 **6 Claims**

5. In an adjusting mechanism for a seat of an automotive vehicle and the like in which the seat rests on carriers elongated in the direction of seat shifting movement, and a seat shifting guide arrangement is interposed between the seat and the carriers, the improvement which comprises:

(a) two groups of lugs respectively unitary with said carriers being arranged on respective side portions of said carriers,

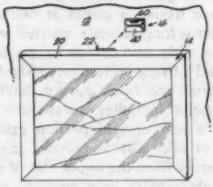
(1) the lugs on one side portion being longitudinally offset from the lugs on the other side portion,

(2) said lugs being partly separated from the remainder of the carrier and extending upward from said remainder



for laterally backing the seat shifting guide arrangement.

4,228,982
HANGING DEVICE FOR PICTURES
Jose M. Sellera, 721 SW. 2 St., Miami, Fla. 33130
Filed Feb. 12, 1979, Ser. No. 11,302
Int. Cl.³ A47F *7/14*
U.S. Cl. 248—467 **3 Claims**

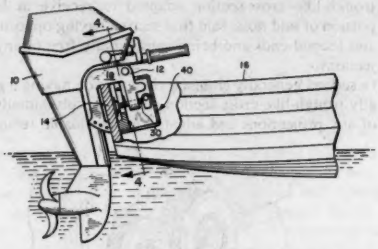


1. A hanging device comprising a wall pad having an adhesive surface and an oppositely facing main surface, said adhesive surface being lined with a removable waxed paper, said opposite surface having an upper edge, a lower edge, and side edges, and outwardly extending angled portion defining a mouth between the portion and the outside surface comprising an open pocket, and a leveler means in the form of a bubble gauge on said opposite surface comprising leveling means for leveling the pad, and

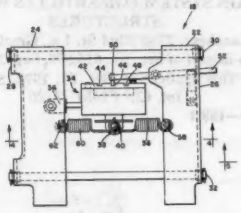
a companionate device for hooked-up engagement, said companionate device comprising a pad having an outwardly downwardly extending portion for hooked-up engagement with said portion and means for attaching said device to a picture frame for use in mounting the picture frame to a wall.

4,228,983
OUTBOARD MOTOR LOCKING DEVICE
John H. Bowman, Jr., 9723 S. Mead, Oak Lawn, Ill. 60453
Filed Dec. 1, 1978, Ser. No. 965,288
Int. Cl.² B63H *21/26*; F16F *15/00*
U.S. Cl. 248—553 **8 Claims**

1. Outboard motor locking means adapted to be fixed to the transom of a boat and comprising means for receiving an outboard motor mounting clamp for an outboard motor, means for enclosing the mounting clamp and said receiving means and means for securing said enclosing means to said receiving means, said receiving means being fixable to the transom of the boat and including a member which is fixed to the inside wall of the transom, said member having two parallel spaced, clamp screw-receiving slots for receiving, respectively, two clamp screws of the outboard motor mounting clamp, said enclosing means including a cover pivotally mounted to said member and adapted to be received over the outer ends of the clamp screws of the outboard motor mounting clamp, and said securing means being operable to lock said cover to said member and over said outboard motor mounting clamp.



4,228,984
VIBRATION ATTENUATOR SEAT
James E. Thompson, and Robert L. Mayfield, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.
Continuation of Ser. No. 861,735, Dec. 16, 1977, which is a continuation-in-part of Ser. No. 689,472, May 24, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 960,125
Int. Cl.² B60N *1/08*
U.S. Cl. 248—636 **19 Claims**



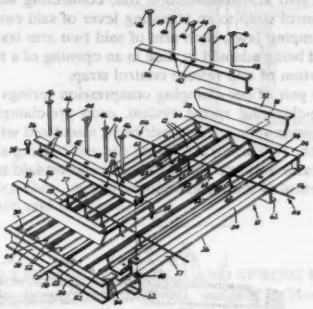
1. A vibration attenuator seat comprising: a base assembly; a seat assembly; antifriction means connecting the base assembly to the seat assembly and supporting the seat assembly relative to the base assembly for predetermined ultra low coefficient of friction horizontal movement of the seat assembly relative to the base assembly; first spring means having a predetermined low spring rate and a predetermined preload operatively connecting the seat assembly to the base assembly for urging the seat assembly in a first direction with a first predetermined spring force and holding the seat assembly in a predetermined operating position with a first predetermined preload force relative to the base assembly; and second spring means having a predetermined low spring rate and a predetermined preload operatively opposed to the first spring means and operatively connecting the seat assembly to the base assembly for urging the seat assembly in a second direction opposite the first direction with a second predetermined spring force and holding the seat assembly in the predetermined operating position with a second preload force relative to the base assembly whereby a positive centering force towards the predetermined operating position is always provided.

4,228,985

APPARATUS FOR PRODUCING MOLDED CONCRETE PRODUCTS

Edmond N. Gaudelli, 2438 Payson Ave., Pittsburgh, Pa. 15220, and Edward E. Shepler, 1733 Potomac Ave., Dormont, Pa. 15216

Filed Feb. 15, 1978, Ser. No. 877,892
Int. Cl.[2] B28B 7/08, 7/18, 7/24
U.S. Cl. 249—93 5 Claims



1. An apparatus for producing a number of molded concrete products from a single molding apparatus, comprising a mold bed having a mold means forming a plurality of elongated mold cavities and elongated mold walls and having reinforcement means surrounding said mold means and forming therewith a unitary structure whereby said mold bed can be carried as a whole, removable end wall portions of said mold cavity which are interfittable between the ends of the mold walls and the adjacent reinforcing means and are removable from said position, bracket means overlying the upper surfaces of said mold cavities and extending traversely to said elongated mold cavities at spaced-apart locations thereof, means for releaseably clamping said transverse bracket members to said reinforcement means, insert means associated with said transverse bracket members and adapted to extend within respective ones of said mold cavities to intersect with an opening at the bottom of a respective one of said mold cavities, load-bearing means receiving complementary portions of said mold bed and adapted for rotational inverting of said mold bed by rotation about said load-bearing means after the molded products are sufficiently hardened, and thereby transferring the weight thereof to the transverse bracket means, said removable clamping means securing said transverse bracket means, and providing detachment of said transverse bracket means to allow for gravity separation of the finished products from within the respective mold cavities.

4,228,986

ATTACHMENT FOR ANCHORING A SAFETY BELT

Vernon R. Schimmel, and Joseph L. Foszcz, both of Chicago, Ill., assignors to Symons Corporation, Des Plaines, Ill.

Filed Mar. 12, 1979, Ser. No. 19,922
Int. Cl.[3] E04G 11/06
U.S. Cl. 249—202 12 Claims

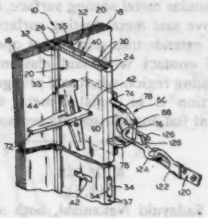
1. An attachment for use in anchoring a safety belt on a supporting member having a vertically extending side surface terminating at a vertically extending free edge on the member, and also having an opening extending therethrough from the side surface, said attachment comprising:

a bracket member having integral body, head, and ear portions, said body and head portions adjoining each other at end margins thereof and said ear portions extending outwardly from one face of said head portion at opposite lateral margins thereof,

said head portion having an opening extending through it from said one face and sized to receive a hook portion of a workman's safety belt therethrough for connecting the belt to the bracket member, and

a connecting member extending outwardly from one face of said body portion and insertable through said opening in the supporting member for connecting the attachment thereto,

said body portion being disposed with said one face thereof adjacent to said side surface of the supporting member



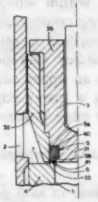
while said head portion and its opening extend outwardly beyond said edge, and said ear portions project over and adjacent to said edge in respective upper and lower positions, when the attachment is connected to the supporting member, the lower one of said ear portions abutting on said edge in torque load-resisting engagement therewith when a downward pulling force is exerted on a safety belt connected to the attachment.

4,228,987

VALVE ARRANGEMENT

Michael B. Potter, Winterbourne, England, assignor to Seetru Limited, Bristol, England

Filed Nov. 27, 1978, Ser. No. 963,802
Claims priority, application United Kingdom, Dec. 20, 1977, 53086/77
Int. Cl.[3] F16K 1/34
U.S. Cl. 251—210 4 Claims



1. A valve of the kind which includes a plunger guided for movement toward and away from a coaxial annular plunger seat surrounding an inlet port of the valve, comprising:

a flat annular metal seating surface on the plunger seat;

a nose on the plunger having a flat annular metal portion thereon positioned to lie in metal-to-metal contact with said metal seating surface when the valve is closed to obturate fluid flow through the inlet port of the valve;

a housing recess defined in said flat annular metal portion, said recess having an open mouth portion;

said flat annular metal portion having an overhang in said housing recess adjacent said open mouth portion;

an annular L-shaped elastomeric sealing element housed in said housing recess, and having a square body portion trapped in said housing recess behind said overhang and a further rectangular portion extending into said open mouth portion of said housing recess and a flat annular sealing region on a terminal end of said further portion, said flat annular sealing portion of said elastomeric sealing element being immediately within but set back from said annular metal surface of said plunger nose to define a

set-off portion of said recess, said elastomeric element square body portion essentially completely filling said housing recess behind said overhang, said rectangular protruding portion having a width approximately one-half the width of said square body portion;

an upstanding annular ridge on said plunger seat flat annular metal seating surface, said ridge being positioned to be immediately adjacent and to surround the inlet port of the valve and to be immediately surrounded by said plunger seat flat annular metal seating surface, said ridge having a height above said metal seating surface sufficient so that said ridge extends into said recess open mouth and into deforming contact with said elastomeric member flat annular sealing region when said plunger nose flat annular metal portion is in metal-to-metal contact with said plunger seat flat annular seating surface.

4,228,988

VALVE

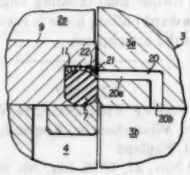
Kazo Higashi; Sadayuki Nakanishi, both of Kobe, and Akio Fukunaga, Kakogawa, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Oct. 20, 1978, Ser. No. 953,111

Claims priority, application Japan, Oct. 28, 1977, 52-129968

Int. Cl.³ F16K *3/00*

U.S. Cl. 251—327 **4 Claims**



1. A gate valve which comprises.

a resilient seat which is circular in cross section;

a retainer housing within which said resilient seat is disposed, said housing comprising a first member and a second member connected to said first member forming an open ended chamber therebetween wherein said first member includes an upper edge portion and said second member includes a lower edge portion, such that said upper and lower edge portions cooperate to retain said resilient seat;

gate means cooperatively engageable with said resilient seat; and

passage means formed in said gate means and in said first member for communicating fluid flowing from said chamber out of said passage means.

4,228,989

ACTUATOR FOR THE RELEASE MECHANISM OF A WINCH RECEIVING A TRACTION ROPE THERETHROUGH

Michel Cavalieri, Neuilly sur Marne, France, assignor to Tractell S.A., France

Filed Feb. 26, 1979, Ser. No. 15,072

Claims priority, application France, Mar. 1, 1978, 78 05835

Int. Cl.³ B66F *3/00*

U.S. Cl. 254—384 **6 Claims**

1. An apparatus for hauling in and out a metal rope to which a load is attached, which comprises:

two pairs of self-clamping jaws acting by turns on the rope by performing a to-and-fro movement under the control of a linkage mechanism,

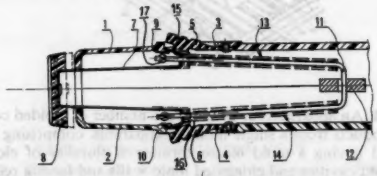
a pre-clamping spring system acting on said pairs of jaws and adapted, when compressed, to cause the jaws of each pair to engage the rope so as to warrant at all time the self-clamping action of the pairs of jaws under the influence of the load,

a release mechanism comprising:

(i) a release control strap slidably mounted in a casing of the apparatus, presenting an end push knob and two flexible substantially parallel arms having their ends bend outwardly, these flexible parallel arms being constantly urged from each other to bear against inner walls of the casing,

(ii) a two arm transmission rod, connecting said release control strap to an actuating lever of said pairs of self-clamping jaws, each arm of said two arm transmission rod being adapted to slide in an opening of a transverse portion of said release control strap,

(iii) a pair of pre-clamping compression springs from the pre-clamping spring system, each pre-clamping compression spring of said pair being associated with an arm of the two arm transmission rod and bearing at one end on said arm and at the opposite end on said transverse portion of the release control strap,



(iv) a lateral aperture provided in each wall of the casing, said apertures registering, each one of said apertures ensuring the locking of said outwardly bent end of the corresponding arm of the release control strap when said release control strap is in a retracted position involving a pre-clamping action of said pair of pre-clamping compression springs,

(v) a release actuator comprising a pair of push-members, each push-member of said pair being fixed in the aperture of a corresponding wall of the casing and being adapted, when actuated by an operator hand, to push inwardly the corresponding arm of the release control strap for unlocking same, thus allowing to move said release control strap to an expanded position in which the pre-clamping action of the pre-clamping compression springs in cancelled and said actuating lever is operated to open simultaneously both pairs of self-clamping jaws.

4,228,990

HYDRAULIC SEWER CLEANING SYSTEM

Steve Horvath, 915 W. Bluelick Rd., Lima, Ohio 45801

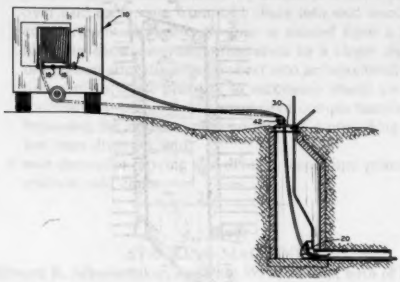
Filed Oct. 26, 1978, Ser. No. 954,999

Int. Cl.³ F21C *29/16*

U.S. Cl. 254—134.3 FT **6 Claims**

1. A hydraulic hose sewer cleaning system and the like, comprising: a movable frame; a hose reel mounted with its axis generally horizontally of said frame; a first wheel positioned to one side of said hose reel, and supported from said frame about a generally horizontal axis that is generally perpendicular to the axis of said hose reel, and with a tangent to its periphery generally centered longitudinally of said reel, said wheel having a groove in its periphery for receiving a hydraulic hose; a generally Y-shaped frame having a base leg and two oblique legs, said oblique legs having hooks thereon for receiving an internal flange of a manhole and the like; a second wheel mounted generally above said base leg, said second wheel having a groove in its periphery for receiving a hydraulic hose from said first wheel and guiding it down a manhole between said oblique legs; and a traverse mechanism between said first

wheel and said hose reel for guiding hose from said first wheel onto portions of said hose reel on opposite sides of said first



wheel; and whereby hose can be fed vertically over said second pulley then laterally to said first wheel and uniformly coiled onto said hose reel.

4,228,991

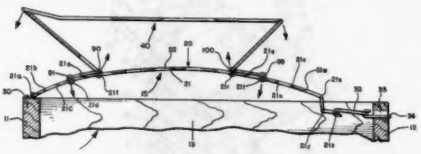
SEAT SPRING ASSEMBLY AND SPRING UNIT

Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Lake Bluff, Ill.

Continuation-in-part of Ser. No. 942,872, Sep. 15, 1978, abandoned. This application Dec. 29, 1978, Ser. No. 974,236

Int. Cl.[2] F16F *1/46*

U.S. Cl. 267—110 **13 Claims**



1. A furniture seat, comprising:

a seat frame having front and back rails;

a seat spring assembly furniture seat mounted between the front and back rails;

said spring assembly including a sinuous spring band connected at its front end to the front frame rail and at its back end to the back frame rail;

said spring band being biased upwardly by means associated with the band; and

a zig-zag wire unit fastened to said sinuous spring band and extending upwardly therefrom;

said zig-zag wire unit including a substantially horizontal wire section for supporting a cushion and including means effective to introduce torquing forces in said band adjacent the front end of the band and at a point removed from the back end of the band but more than half of the distance between the front seat frame rail and the back seat frame rail.

4,228,992

SHEET SELECTING AND DISPENSING APPARATUS

Adi K. Ashburner, Hargrave, England, assignor to Harper & Tunstall, Limited, Dennington, England

Filed Nov. 24, 1978, Ser. No. 963,423

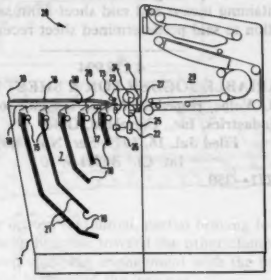
Int. Cl.[3] B65H *43/00*

U.S. Cl. 270—59 **10 Claims**

1. Apparatus for positioning a primary sheet having a leading edge and a leading end portion and for selecting a secondary sheet of a desired size in a store containing secondary sheets of different sizes which each having a leading edge and a leading end portion and are arranged in groups for dispensing the selected secondary sheet from the related group so that the secondary sheet is associated and aligned with the primary sheet, the secondary sheet being selected in accordance with the size of the primary sheet, characterised in that:

stop means are provided as an abutment for the leading edges of the primary and secondary sheets;

first sensing means are provided for sensing the size of the primary sheet and are adapted to operate so that as the primary sheet is fed into the apparatus, until its leading edge arrives at the stop means, the sensing means producing a control signal indicative of the size of the primary sheet; and



dispensing means are provided for operation in response to the control signal for automatically selecting one of said groups and dispensing a secondary sheet therefrom so that the secondary sheet moves away from the group until after its leading edge arrives at the stop means, in which position the secondary sheet is associated and aligned with the primary sheet and the leading end portions of the primary and secondary sheets are in facing abutment with each other.

4,228,993

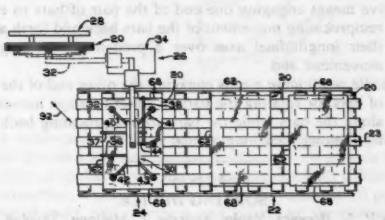
SHEET ORIENTING AND TRANSPORTING FRAME

William P. Cathers, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 901,944

Int. Cl.[2] B65H *9/06, 29/24*

U.S. Cl. 271—236 **15 Claims**



1. Sheet orienting and transporting apparatus for transferring a sheet from a sheet supply position to a predetermined sheet receiving position, comprising:

a pair of sheet orienting members;

means for maintaining said pair of sheet orienting members in predetermined spaced relationship to one another to define orienting axes;

means for moving said pair of sheet orienting members along a first reciprocating path towards said sheet supply position into a sheet engaging and orienting position and away from said sheet supply position toward a sheet non-engaging position;

means for displacing said maintaining means in a sheet ori-

enting direction along a second reciprocating path from a remote position to the sheet supply position and for moving said maintaining means in a non-orienting direction along the second reciprocating path subsequent to orientation of said sheet, said second reciprocating path being transverse to said first reciprocating path; and

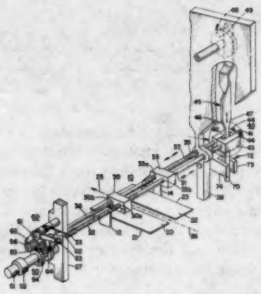
means mounted on said maintaining means for engaging an oriented sheet to said maintaining means for movement therewith subsequent to movement of said maintaining means in said orienting and non-orienting directions, said means for displacing said orienting members moving said maintaining means and said sheet from said sheet supply position to said predetermined sheet receiving position.

4,228,994

VARIABLE JOGGER FOR A SHEET FEEDER

Richard L. Volpe, Hopedale, Mass., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jul. 16, 1979, Ser. No. 58,093
Int. Cl.[3] B65H *9/10*
U.S. Cl. 271—250 **10 Claims**



1. A sheet jogger mechanism comprising:

a pair of carriage support bars extending across a sheet feeding path lying between the ends of the pair of bars, each bar being rotatable on its longitudinal axis;

a pair of paddle providing carriage members each carried on a respective one of the pair of bars, bidirectional rotation of the bars effecting movement of the carriage members back and forth along the bars;

drive means engaging one end of the pair of bars to effect reciprocating movement of the bars back and forth along their longitudinal axes over a predetermined range of movement; and

paddle positioning means engaging the other end of the pair of bars for rotating the bars to effect carriage movement along the bars while the bars are reciprocating back and forth along their longitudinal axes.

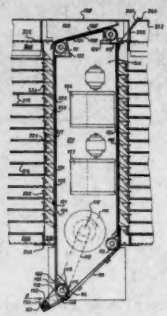
4,228,995

SORTING DEVICE

Theo P. C. Breuers, Venlo; Andreas T. Heijnen, Tegelen, and Hendrikus J. J. van Soest, Helden, all of Netherlands, assignors to Oce'-van der Grinten N.V., Venlo, Netherlands

Filed Jan. 8, 1975, Ser. No. 539,542
Claims priority, application Netherlands, Jan. 21, 1974, 00758; Jan. 21, 1974, 00759
Int. Cl.[3] B65H *31/24*
U.S. Cl. 271—292 **22 Claims**

1. Apparatus for the assorted collection of sheets, comprising means for transporting sheets to be assorted successively along a sorting track, a group of bins situated along a side of said track, and guide organs movable selectively into said track and each operative therein to divert a sheet therefrom into a pertaining bin, characterized in that each bin of a plurality of said bins has a guide organ unified therewith and is movable to and fro relative to said track and independently of the other of said bins between two positions in a first of which the guide organ on the bin is situated out of the path of movement of a



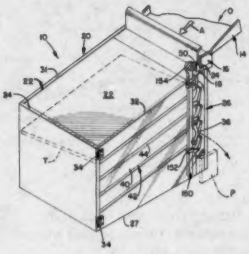
sheet in said track and in the second of which said guide organ protrudes into said path to divert a sheet from said track into one of said bins.

4,228,996

AUTOMATIC SHEET COLLATOR

Earl H. Wilcox, Jr., 1208 Windsor Rd., Florence, S.C. 29501

Filed Sep. 17, 1979, Ser. No. 76,468
Int. Cl.[3] B65H *31/24*
U.S. Cl. 271—297 **11 Claims**



1. A collator comprising:

a housing adapted to be associated with a source of sheets to be collated, said housing having a plurality of compartments therein for receiving collated sheets, an access means for permitting access to said compartments, an entranceway defining means for diverting sheets from a source of sheets into said housing, and a sheet chute defining means positioned in said housing to receive sheets from said entranceway;

a plurality of sheet diverter vanes each associated with one of said housing compartments and located to divert sheets from said chute into said associated compartment, each of said sheet diverter vanes having a base portion, a leading arm and a trailing arm each connected to said base portion, a rocker means on said base portion between said arms and rockably connecting each sheet diverter vane to said housing, a diverter vane rocking means movably mounted in said sheet diverter vane adjacent said rocking means, said diverter vane rocking means including a keeper chamber defined in said diverter vane and a weight located in said keeper chamber to be movable from a first position on the trailing arm side of said rocker means across a rocking axis defined by said rocker means to a second position located on the leading arm side of said rocker means, said diverter vanes being positioned adjacent said chute so that said vane leading arms block said sheet chute when said vane rocking means is in said second position and unblock said chute when said vane rock-

ing means is in said first position, said vane rocking means of each diverter vane being moved from said second position to said first position by action of a sheet passing over said each vane from said chute into said associated compartment so that each vane is moved from a chute blocking sheet diverting orientation to a chute clearing orientation after diverting a sheet into an associated compartment so that a plurality of successive sheets are each successively diverted into successive compartments after bypassing the compartment into which a preceding sheet has been diverted; and

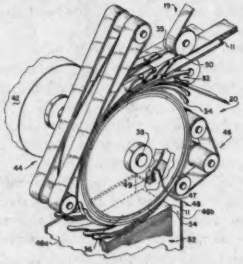
a reset means for moving said diverter vanes into position to occlude said chute.

4,228,997

STACKING MACHINE

Edward B. Schoonmaker, and Paul W. T. Moran, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,617
Int. Cl.³ B65H *29/20, 29/40*
U.S. Cl. 271—315 **7 Claims**



1. In a device for transporting through a curved path, sheets received seriatim at high speed, wherein a plurality of overlapping web elements are attached at one end of each element to the periphery of a member which is rotatable in the direction of said attached ends, the other ends of the web elements being free to move relative to each other to provide sheet receiving pockets between adjacent web elements,

the improvement wherein said pocket providing ends of the web elements have a preformed bend toward the rotatable member and are more flexible than the leading edge portions of the sheets so that upon collision between an incoming sheet and a web tip, the web is deflected, because of its flexibility and preformed bend, toward the rotatable member to insure reception of the sheet between that web and an adjacent underlying web.

4,228,998

BRAKING APPARATUS FOR DOG TRACK RABBIT LURE CAR

Lorn L. Trickel, 8806 NE. Thompson St., Portland, Oreg. 97220

Filed Nov. 30, 1978, Ser. No. 964,950
Int. Cl.³ A63K *1/02, 3/00*
U.S. Cl. 272—4 **5 Claims**

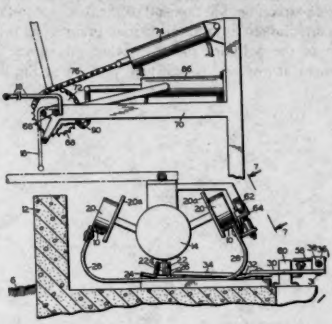
1. Dog track rabbit lure car braking apparatus for a lure car provided with a longitudinally arranged brake shoe, the braking apparatus comprising:

(a) laterally spaced, elongated clamp members positioned for traversal by the lure car with the brake shoe extending between the clamp members,

(b) drive means connected to one of the clamp members for moving it toward and away from the other clamp member between brake shoe clamping and unclamping positions,

(c) first control means for the drive means for moving said one clamp member toward said other clamp member into pre-set preliminary clamping engagement with the brake shoe to effect initial, partial braking of the lure car, and

(d) second control means for the drive means operable by



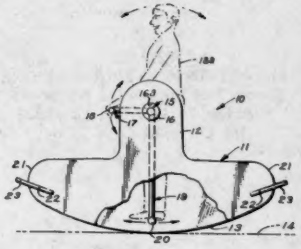
the lure car during said initial, partial braking for moving said one clamp member toward the other clamp member into increased clamping engagement with the brake shoe to effect final braking of the lure car.

4,228,999

SOMERSAULT SWING

W. Ted Armstrong, P.O. Box 40962, San Francisco, Calif. 94140

Filed Oct. 13, 1978, Ser. No. 951,163
Int. Cl.³ A63G *1/20*
U.S. Cl. 272—33 R **5 Claims**



1. A somersault swing, comprising, in combination, a pair of parallel spaced-apart side members each with an arcuate bottom rocking surface, for rocking engagement with a floor or ground surface, a shaft rotatably received in said pair of parallel spaced-apart side members and extending therebetween, with a horizontal and "T"-shaped handle secured thereto, and a "T"-shaped foot rest bar secured to said shaft, for the person using said swing to stand upon with his hands grasping the handle whereby on sufficient rocking the person may rotate about the shaft.

4,229,000

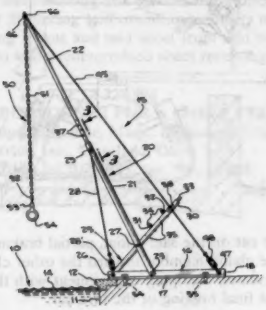
TRAPEZE FIXTURE

J. Daniel Scherling, 4431 Ocean View, Apt. 8, Montrose, Calif. 91020

Filed May 21, 1979, Ser. No. 40,509
Int. Cl.³ A63B *7/02*
U.S. Cl. 272—61 **10 Claims**

1. An adjustable trapeze fixture comprising a base, a side structure mounted on each side of the base in spaced parallel

relationship, each side structure comprising a column having its lower end anchored to the base intermediate fore and aft portions of the base and extending obliquely upwardly and forwardly over said fore portion of the base, a diagonal brace having an attachment at one end to the fore portion of the base and an attachment at an intermediate point to an intermediate portion of the column, and a forward guy brace having an attachment at one end to the fore portion of the base at the



other end to the upper portion of the column, a plurality of parallel rungs extending from one diagonal brace to the other whereby to serve as platforms for the user, a longitudinally adjustable extension with its lower end removably secured to the column, an aft guy brace having an anchored attachment at the upper end of the column, said aft guy brace having an adjustable connection at its lower end to the aft portion of the respective side of the base, and a trapeze sling having an attachment to the tops of the extensions.

4,229,001

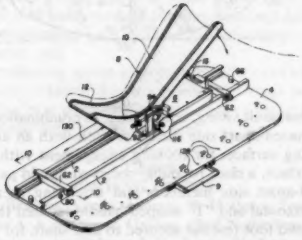
THERAPEUTIC EXERCISE DEVICE

Michael P. Roman, 1969 Virginia La., Norristown, Pa. 19401

Filed Feb. 23, 1979, Ser. No. 15,522

Int. Cl.³ A63B *23/04, 21/04*

U.S. Cl. 272—96 **20 Claims**



1. Therapeutic exercising apparatus comprising,

elongated guide means,

a carriage assembly engaged with and guided by said elongated guide means,

a boot assembly supported on said carriage assembly, said boot assembly including a leg receiving member for engaging the lower leg of a patient and a sole member for engaging the sole of a patient's foot, said sole member being movable relative to said leg receiving member about a substantially horizontal pivot axis, said boot assembly being movable in a substantially horizontal linear path and in a substantially horizontal arcuate path.

4,229,002

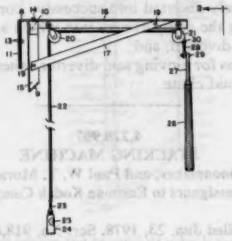
GOLF SWING EXERCISE DEVICE

David H. Masters, 7254 Blanco, #101, San Antonio, Tex. 78216

Filed Sep. 21, 1978, Ser. No. 944,417

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—117 **6 Claims**



1. A portable golf swing exercise device adapted to be attached and supported by a door, wall, or other upright structure for positioning above a golfer's head comprising:

(a) elongated base means adapted to project along a vertical plane surface;

(b) base support means attached to said elongated base means for mounting said elongated base means on a vertical plane surface above said golfer's head retaining said base means in a stable position;

(c) a projecting beam with a first end secured to said elongated base means and projecting normal thereto, said projecting beam having a second end;

(d) a stabilizer secured at one end of said elongated base means and projecting upward from an extension of said elongated base means at an angle to said second end of said projecting beam interconnecting and retaining said elongated base and said projecting beam in a fixed spaced position;

(e) a first pulley attached to said projecting beam adjacent to said first end;

(f) a second pulley attached to said projecting beam adjacent to said second end;

(g) rope means passing through said first and second pulleys;

(h) golf grip means attached to a first end of said rope means nearest said second pulley; and

(i) load means attached to a second end of said rope means nearest said first pulley, said load means moving responsive to movement of said golf grip means by said golfer to simulate swinging of a golf club through approximately 180 degrees of swing.

4,229,003

FISHING TOY

Takeshi Shimizu, Yashioshi, Japan, assignor to Kabushikikaisha Anoa, Tokyo, Japan

Filed Dec. 14, 1978, Ser. No. 969,324

Claims priority, application Japan, Apr. 6, 1978, 53-44294[U]

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—1 E **3 Claims**

1. A fishing toy comprising:

a base having a generally horizontal top surface;

a turntable rotatably centrally mounted flush with and on an axis normal to said horizontal top surface of said base;

a means for rotating said turntable;

a plurality of flat, magnetically attractive objects randomly disposed on said turntable; and

a plurality of manually operated spring-loaded, normally upright retrieval mechanisms each having an upper portion carrying a magnet, and having a lower portion swivelably connected to said base above said turntable and a linkage pivotally connected to respective upper and lower portions of a mechanism, said retrieval mechanisms hav-

ing a spring-loading release means for momentarily causing cooperative simultaneous forward and downward movement of said upper and lower portions and said linkage to position said magnet adjacent said turntable;

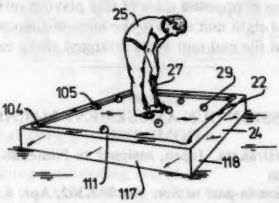
such that one of said objects disposed on said turntable may by attracted by said magnet and lifted from said turntable by each said retrieval mechanism upon return to an upright position.

4,229,004

FLOOR TYPE POOL GAME APPARATUS

Alvin R. Stokes, 700 N. Zimmer, Pampa, Tex. 79065

Filed Aug. 4, 1978, Ser. No. 930,902
Int. Cl.³ A63J 3/00
U.S. Cl. 273—3 C **2 Claims**



1. A portable billiard game apparatus comprising, in combination, a substantially rectangular playing surface and surface support assembly and a rim and rim support assembly,

the surface and surface support assembly comprising a frame assembly, a plurality of adjacently positioned like floor support units, a plurality of like frame support and adjustment assemblies and an upper playing surface,

said frame assembly comprising straight rigid side elements and transverse rigid straight frame elements extending between and fixed to said side elements,

the floor support units each comprising a core composed of a plurality of vertical rigid floor support columns and a strong skin extending thereover,

the cross-section of each floor support unit being trapezoidal in its transverse cross-section,

said skin completely enclosing and being tightly and firmly attached to (a) the columns of each of said floor support units and (b) components of the frame assembly to provide a light yet rigid support structure, the skin of adjacent floor support units are firmly joined together at junctions of the adjacent extremities thereof,

said playing surface being flat and comprising a lower foam rubber layer, a middle fabric layer and an upper pile layer, all firmly joined together, said foam rubber layer being firmly attached to said skin said playing surface further having ball receiving pockets, each pocket being an opening at each corner and an opening intermediate each longitudinal side of said playing surface,

each frame support and adjustment assembly comprises a rigid foot plate and an adjustable support therefor whereby each foot plate may be raised and lowered relative to the frame assembly,

said rim and rim support assembly comprising side rails attached to said frame assembly, said side rails extending above, and around the perimeter of said playing surface;

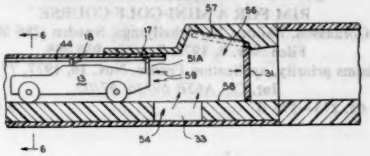
cushion means attached to said side rails for rebounding balls rolling on said playing surface.

4,229,005

TRACK RACING GAME

Gordon A. Barlow, Evanston; Anthony T. Janiszewski, Elmwood Park, and John R. Krutsch, Glenview, all of Ill., assignors to Gordon Barlow Design, Skokie, Ill.

Filed Dec. 14, 1978, Ser. No. 969,584
Int. Cl.³ A63F 9/14
U.S. Cl. 273—86 D **9 Claims**



1. A racing game,

said game comprising a track,

racing objects for racing over said track,

said track making a complete circuit,

said track having a starting section transparently enclosed wherein each of the racing objects are laterally positioned abreast of each other,

said track further having a racing section dimensioned to hold at least two racing objects juxtaposed, and

wherein said racing section is unobstructed so that each racing object is free to laterally traverse the said racing section,

said starting section further comprises entrance means for receiving said racing objects from said racing section,

said entrance means leading to an impluse chamber for each of said racing objects,

impulse means in said impulse chamber for providing forces to said racing objects to propell said racing objects over said racing section,

said impulse chamber leading directly to an orienting portion, and

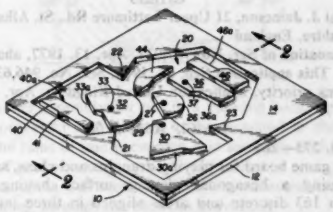
means in said orienting portion for maintaining said racing objects directed straight forward.

4,229,006

MAZE PUZZLE

Harold Morse, 1445 S. Pearl, Denver, Colo. 80210

Filed Jun. 28, 1979, Ser. No. 53,093
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **10 Claims**



1. A maze puzzle comprising:

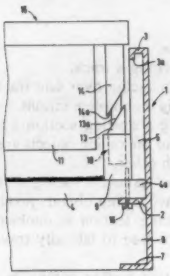
(a) a playing board having a planar recessed playing area with a complete peripheral border, said playing area having a predetermined size and shape;
(b) a series of spaced, pivoted shapes, each being a portion of a geometrical configuration and mounted in said recessed area to provide a limited passage therearound for free playing pieces;
(c) a series of free playing pieces, each one of which is a complement of one of said pivoted shapes arranged to mate therewith and form a predetermined geometrical shape, and to pass around each one of said pivoted shapes in predetermined positions; and
(d) at least one general central pivoted shape of small dimensions mounted on said playing area arranged as a limit to passage of said free playing pieces and being without a mating piece.

4,229,007

RIM FOR A MINI-GOLF COURSE

Jan Göransson, Ekliden 20, Örkelljunga, Sweden (286 00)

Filed Nov. 8, 1978, Ser. No. 958,695
Claims priority, application France, Nov. 16, 1977, 77 34965
Int. Cl.³ A63B *69/36, 67/02*
U.S. Cl. 273—176 B **5 Claims**



1. A rim for a mini-golf course comprising:
(a) a continuous profile element having at least two flange portions turned inwardly,
(b) a plate having an end portion positioned on one of said flange portions forming a play ground,
(c) a rim element extending substantially between said flange portions forming the side of the play ground wherein said plate and said rim element form a corner and substantially fill the space between said flange portions,
(d) a corner strip positioned substantially at the juncture of said plate and rim element and being anchored to said one flange portion and said plate element whereby said corner strip is anchored to said rim and retains said rim element against said profile.

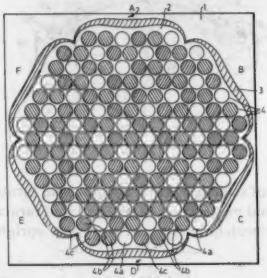
4,229,008

BOARD GAMES FOR PLAYING DRAUGHTS AND CHESS

Michael J. Jameson, 21 Upper Lattimore Rd., St. Albans, Hertfordshire, England

Continuation of Ser. No. 787,021, Apr. 13, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,637
Claims priority, application United Kingdom, Apr. 15, 1976, 15601/76
Int. Cl.³ A63F *3/02*
U.S. Cl. 273—261 **7 Claims**

1. A game board for playing draughts and chess, said board comprising a hexagonal playing surface having marked thereon 163 discrete unit areas aligned in three intersecting mutually inclined sets of parallel lines with the unit areas being spaced apart from each other by equal distances to form a regular equilateral triangular array, each set of lines of unit areas being parallel to a respective pair of opposite sides of said hexagonal playing area, each side of said hexagonal playing area having six unit areas spaced apart therealong, a single unit area being omitted from each of the corners of said hexagonal playing area and the unit areas being arranged in three mutually distinguishable sets so that in each set the unit areas are separated from each other in each of said lines by two unit



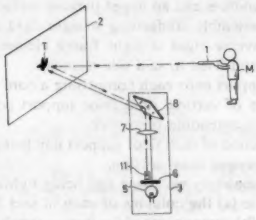
areas belonging one to each of the other sets, the unit areas of said playing surface arranged in a plurality of files, each file beginning with a unit area along one side of said playing surface and ending with a unit area at the side opposed to said one side, each file having end unit areas of the same distinguishable set of unit areas at opposed sides of said playing surface, there being a total of eight unit areas of the same distinguishable unit area set as said file end unit areas arranged along each file.

4,229,009

LIGHT-EMISSION GUN AMUSEMENT MACHINE FOR HOME USE

Takao Ohta, Hirakata, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 893,302, Apr. 4, 1978, abandoned. This application May 15, 1978, Ser. No. 906,277
Claims priority, application United Kingdom, Apr. 5, 1977, 14414/77; Japan, May 13, 1977, 52-55803
The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.
Int. Cl.³ F41J *5/02, 9/14*
U.S. Cl. 273—312 **11 Claims**



11. A light-emission gun amusement device for projecting a light image onto a screen and receiving a reflected light image from said screen, said device comprising:
a light-emission gun;
a machine housing separate from said light-emission gun and said screen;
a light source within said housing;
a photoelectric element within said housing above said light source;
lens means within said housing between said photoelectric element and said screen for substantially coaxially aligning

the light rays shining from said light source to said screen and said light rays from said screen reflected toward said photoelectric element;

an electrically operated motor within said housing;

an electrical power source connected to said light source and said motor;

a power source control means between said power source and said motor actuated by said photoelectric element for reversing the electrical connection between said power source and said motor and for reversing the normal rotational direction of said motor; and

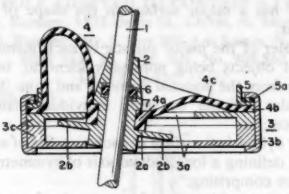
target producing means within said housing between said light source and said photoelectric element operatively connected to said motor for producing target and hit images of said light source on said screen.

4,229,010

SELF-ALIGNING SHAFT SEAL

Wilfred H. St. Laurent, Jr., Marblehead, Mass., assignor to Bellofram Corporation, Burlington, Mass.

Filed Dec. 20, 1978, Ser. No. 971,615
Int. Cl.³ F16J *15/52*
U.S. Cl. 277—30 **3 Claims**



1. A self-aligning shaft seal comprising

(a) a shaft;

(b) a bushing surrounding said shaft;

(c) a fixed structure defining an aperture, said bushing being arranged in said aperture with a clearance left between said bushing and said fixed structure;

(d) a convoluted diaphragm having radially inner support means and having radially outer support means for the convoluted wall thereof;

(e) said radially inner support means being affixed to said bushing;

(f) said radially outer support means being affixed to said fixed structure; and wherein

(g) said bushing has the external shape of a frustum of a cone having an external groove therein adjacent the bottom thereof, and wherein said diaphragm has a radially inner elastomeric portion of increased thickness engaging said groove.

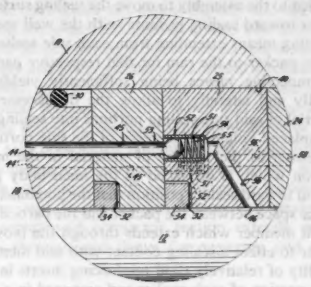
4,229,011

LUBRICATION SYSTEM FOR RECIPROCATING PLUNGER COMPRESSORS

Karl W. Wikelski, and Henry K. Tyson, both of Odessa, Tex., assignors to El Paso Polyolefins Company, Paramus, N.J.

Continuation of Ser. No. 671,872, Mar. 29, 1976, abandoned.
This application Jul. 3, 1979, Ser. No. 54,543
Int. Cl.³ F16J *15/40, 15/46*
U.S. Cl. 277—72 FM **10 Claims**

1. An assembly for compressing an operating fluid to a high pressure comprising a reciprocatory plunger rod compressor cylinder lubricated with a fluid other than the operating fluid; an attendant plunger rod; a crank mechanism connected to one end of the plunger rod for imparting thereto a reciprocatory motion of alternating suction and discharge strokes; laterally surrounding said plunger rod an annular seal assembly which includes a plurality of closely abutting continuous annular seal elements the inner peripheries of which lie immediately adjacent the outer periphery of said plunger rod and at least one of which annular seal elements contains a bored, lubricant-supply passageway running internally through the solid body of same; upstream of said seal element and in communication with said passageway a lubricant supply source; a two-part pressure-



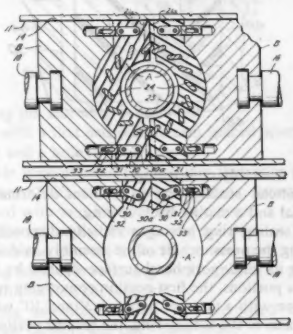
actuated check valve located in the lubricant supply passageway of said annular seal element for permitting flow of lubricant from the supply source during a suction stroke of the plunger rod, and which check valve is non-responsive to the ambient pressure outside the compressor assembly.

4,229,012

VARIABLE BORE PACKER ASSEMBLY FOR RAM-TYPE BLOWOUT PREVENTERS

Bolie C. Williams, III, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 28, 1978, Ser. No. 901,062
Int. Cl.³ E21B *33/06*
U.S. Cl. 277—127 **11 Claims**



1. A packer assembly for use in a variable bore, ram-type blowout preventer and adapted to be mounted in the front faces of the rams of said preventer, said assembly including,

a pair of packers coacting with each other to encircle and seal around a well member within a preselected size range extending through the blowout preventer,

each packer comprising, a main body portion of resilient material having a recess in its front face,

the front face which defines the recess forming a sealing

surface engageable with the exterior of the well member when the resilient material of the main body portion is displaced in a direction to move said sealing surface into contact with such member,

side sealing portions of resilient material on each side of the main body portion and located adjacent the sides of the front face of the recess,

said side sealing portions having a volume of resilient material which is displaced radially inward when a force is applied to the assembly to move the sealing surface of said recess toward sealing position with the well member,

connecting means extending from each side sealing portion of the packer to the ram for that respective packer,

said connecting means being sufficiently yieldable rearwardly and laterally to allow the displacement of the material of said side sealing portions into sealing position,

said displaced volume of material of the side portions being so related to the volume of material in the main body portion which is displaced as the main body portion is moved toward sealing position that the combined volumes fill the space between the packer and the particular size of a well member which extends through the blowout preventer to effect a sealing contact with said member,

a plurality of relatively rigid reinforcing inserts in the main body portion of each packer and arranged in a generally semi-circular path,

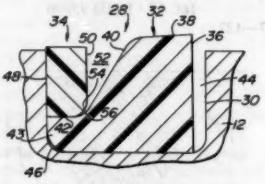
said inserts coacting with each other as the resilient material of the main body portion is displaced toward the well member to prevent extrusion of the resilient material in a vertical direction along the well member after the resilient material has engaged said member.

4,229,013

SPRING SEAL

John A. Burke, Rocky River, Ohio, and James B. Gross, Lansdale, Pa., assignors to Greene, Tweed & Co., Inc., North Wales, Pa.

Filed Jul. 2, 1979, Ser. No. 53,883
Int. Cl.³ F16J *15/00*
U.S. Cl. 277—188 R **4 Claims**



1. A seal assembly comprising:

(a) an annular sealing ring of resilient deformable plastic material and a mating back-up ring,

(b) said sealing ring having a radially disposed side face defining the pressure side of the assembly, said sealing ring having its inner peripheral surface defined by three contiguous portions, the first portion converging toward said side face with a taper of between 3° and 10° with respect to the axis of the sealing ring, the second portion being an angled surface extending outwardly from said first portion at an angle of between 20° and 40° with respect to a radius on said sealing ring, said third portion being an axially extending flange adjacent the outer periphery of said sealing ring,

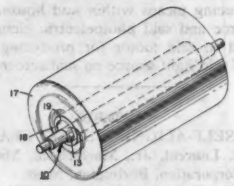
(c) said back-up ring being disposed radially inwardly of said third portion and having radially disposed side faces, one side face of said back-up ring cooperating with said second portion to define a generally triangular shaped space on the inner periphery of said assembly with the apex of the triangular shaped space extending radially outwardly.

4,229,014

AIR-EXPANDED MANDREL HAVING MEANS TO EQUALIZE EXPANSION TO OBTAIN CONCENTRIC CHUCKING

Thomas J. Crowe, 177 Rockaway Ave., Rockaway, N.J. 07866, assignor to Thomas J. Crowe, Rockaway, N.J.

Continuation of Ser. No. 850,497, Nov. 11, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,521
Int. Cl.³ B23B *31/40*
U.S. Cl. 279—2 A **7 Claims**



1. In a device for holding and rotating any one member of a class of objects;

said class of objects being characterized in that each member thereof has a major surface in the shape of a circular cylinder,

the diameter of the major surface of each member of said class of objects being nominally identical, but varying slightly from the nominal diameter and from the shape of a circular cylinder by small individual manufacturing tolerances;

the major cylindrical surface of each member of said class of objects defining a longitudinal axis of symmetry;

said device comprising:

means to rotate said device about an axis of rotation;

a support body carried by said means to rotate, extending longitudinally from said means to rotate along the said axis of rotation and disposed symmetrically about said axis of rotation;

a plurality of identical abutting members symmetrically arranged about said axis of rotation;

each of said identical abutting members being supported on said support body by guide means for limited radial movement perpendicularly to said axis of rotation between an extended and a retracted position;

the extend of and limits of motion of said abutting members permitted by said guide means being such that, when the abutting members are in said retracted position any member of said class of objects may be placed in opposition to said plurality of abutting members of said device without the occurrence of any binding, and, when the abutting members are advanced from said retracted position towards said extended position, said abutting members abut against said major surface of said member of said class of objects and are thereby prevented from advancing further towards said extended position;

a plurality of identical push means, in one-to-one correspondence with said plurality of identical abutting members, arranged about said axis of rotation;

each of said identical push means being supported on said support body for limited radial movement perpendicularly to said axis of rotation between an extended and a retracted position;

said extended position of each of said identical push means being determined by seating engagement of said push means with a limiting surface of said support body, said limiting surface being accurately concentric with said axis of rotation;

elastomeric bladder means, capable of inflation and deflation, for radially extending said plurality of identical push means, to the extent determined by the said limiting surface of said support body, and for radially permitting withdrawal, of said plurality of identical push means;

the improvement comprising:

a plurality of identical stiff elastic means for communicating radial movement of each of said identical push means to the corresponding one of said identical abutting means;

whereby, when said one member of said class of objects and said device for holding and rotating are positioned, relatively to each other, so that said plurality of abutting members are in opposition to said major cylindical surface, and when said elastomeric bladder means is inflated, said elastomeric bladder will expand and radially extend each of the identical push means into seating engagement with said limiting surface, thereby correspondingly communicating movement, by way of a corresponding stiff elastic means, to the corresponding abutting member, thereby compressing said stiff elastic means, to radially extend said abutting member into abuttment with said major cylindrical surface;

the spring deflection rate of said plurality of identical stiff elastic means being sufficient that any eccentric gravity forces present during inflation of said elastomeric bladder means do not substantially interfere with alignment of said axis of rotation and said longitudinal axis of symmetry as said inflation is completed.

4,229,015

SKI POLE ADAPTED TO CONTAIN A LIQUID

Richard R. Ramsey, 1121 Davis St., Clovis, N. Mex. 88101, and James B. Ramsey, Rte. 5, Box 300, Los Lunas, N. Mex. 87031

Filed May 25, 1978, Ser. No. 909,563
Int. Cl.[2] A63C *11/22*
U.S. Cl. 280—819 **1 Claim**

1. In a ski pole comprising a shaft, a hand grip, a stop basket, and a cavity in said shaft,

the improvement comprising non-toxic liner means directly on the interior wall of said shaft in said cavity, whereby said cavity is adapted to contain a liquid,

hand strap means on said hand grip,

and access means, in said hand grip, to said cavity,

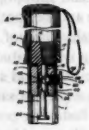
said access means being an internally threaded bore in said hand grip, and a hollow, open-ended plug means adapted to be received in said bore and to engage a sealing means in said hand grip.

4,229,016

SAFETY SKI POLE

David Wolf, 67 Brackett Rd., Newton, Mass. 02159

Filed Nov. 6, 1978, Ser. No. 957,980
Int. Cl.[3] A63C *11/22*
U.S. Cl. 280—821 **3 Claims**



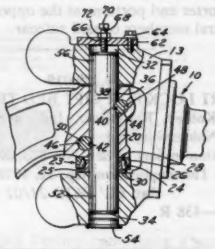
1. A ski pole adapted to fold on application of a force of a predetermined minimum magnitude in a direction angular to its length, said pole comprising an upper tubular section and a separate lower tubular section, means for securing said sections in longitudinal alignment against forces angular to the length of said pole and below a preselected magnitude and for allowing said upper section to be moved to a position angular to the length of said lower section in response to forces above said preselected minimum magnitude in directions at an angle to the length of said pole, said means for securing comprising a flexible member having one end extending into said upper tubular section and the other end extending into said lower tubular section and further having a connector section secured in one of said upper and lower tubular sections and extending into the other thereof, said connector section securing said upper and lower tubular sections together when said upper and lower sections are folded in response to the applications of a force in excess of said preselected minimum, said means for securing further including a cylindrical end secured in said upper tubular section and integral with said connector section, a sleeve secured in said lower tubular section and having a hole through which said connector section extends, and means extending through said sleeve for engaging said connector section.

4,229,017

KING PIN ASSEMBLY

Vincent H. Hagedorn, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 29, 1978, Ser. No. 947,281
Int. Cl.[2] B60G *3/02*
U.S. Cl. 280—96.1 **10 Claims**



1. A king pin assembly comprising:

a yoke with a first and second arm spaced apart from each other and a hole in each arm;

a knuckle support sized to fit within the space between the two arms with an aperture extending therethrough and aligned with said holes in the two arms;

a kingpin extending through the aperture in the knuckle support and into the holes in the two arms;

retaining means for retaining the kingpin in its position relative to the knuckle support;

a bearing assembly operatively interposed between the knuckle support and one of the arms;

a separate adjustable member being longitudinally adjustable in the hole of the first arm;

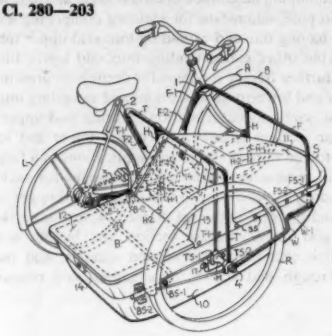
means for adjustably securing said separate member in a plurality of fixed longitudinal positions in the hole of the first arm;

said separate member being operably connected to the knuckle support for pressing the knuckles and bearing assembly toward the second arm such that the bearing assembly is in snug abutting relationship interposed between the knuckle support and said one of the arms.

4,229,018
TORSIONALLY RESILIENT STRUCTURE FOR A SIDECAR

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 437,482, Jan. 28, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,566
Int. Cl.[2] B62K *27/12*
U.S. Cl. 280—203 64 Claims

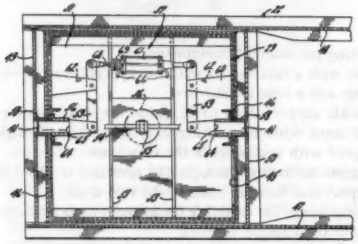


1. In combination a coupling structure to operatively couple a sidecar to existing two-wheel tandem-type land vehicle, the structure comprising plural, rigid and torsionally resilient connecting members, each bent to form a longer mid-portion and two shorter end-portions; their longer mid-portions positioned substantially horizontally and transversely between the two-wheel vehicle and the sidecar, their shorter end-portions on one side aligning with and operatively attached at two points to rigid structural members of said two-wheel vehicle and their shorter end portions at the opposite side attached to rigid structural members of said sidecar.

4,229,019
TRANSPORT LOCK FOR LIFT BED TRAILER JACKBOX

Charles R. Kohley, Rensselaer, Ind., assignor to Eugene A. LeBoeuf, Noblesville, Ind.

Continuation-in-part of Ser. No. 823,680, Aug. 11, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,297
Int. Cl.[3] B62D *21/02*
U.S. Cl. 280—438 R 9 Claims



1. In a lift bed highway trailer attachable to a tractor by means of a fifth wheel connection and adapted to carry a pallet frame unit with legs spaced to straddle the trailer, the combination comprising:

(a) a liftable main frame having a lowered loading and unloading position and a raised transport position;

(b) a subframe underlying said main frame and pivotally connected to same;

(c) a wheeled suspension underlying said subframe and adapted to serve as a ground support therefor;

(d) a gooseneck fixed to the forward end of said main frame and having a pair of longitudinal structural members and a pair of transverse structural members defining a jackbox opening therebetween;

(e) a jackbox mounted within said opening for vertical sliding movement relative to said gooseneck, said jackbox being adapted for attachment to the tractor fifth wheel;

(f) power lift means for moving said main frame and gooseneck between the lowered loading and unloading position and the raised transport position;

(g) a pair of power actuated shot pins mounted in said jackbox in axially spaced relation with each other in the longitudinal center plane of the trailer, said shot pins being adapted to be moved outwardly from said jackbox in a locking stroke to engage said gooseneck and inwardly in a return stroke to disengage said gooseneck;

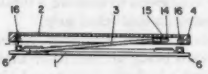
(h) abutment means defining the limits of the locking stroke and the return stroke of said shot pins; and

(i) means including a double acting fluid actuator connected between said shot pins and offset laterally from said longitudinal center plane of the trailer; said actuator being adapted to drive said shot pins positively through both the locking stroke and the return stroke.

4,229,020
SAFETY STRAP FOR SKIS

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Nov. 2, 1978, Ser. No. 957,087
Claims priority, application Austria, Nov. 7, 1977, 7911/77
Int. Cl.[3] A63C *9/086*
U.S. Cl. 280—618 9 Claims



1. In a safety strap for a ski arranged between a ski-fixed base plate and a ski boot-fixed support plate and maintaining, following a release of a ski boot, a connection between said ski boot and said ski, wherein the improvement comprises releasable connecting means for releasably connecting said base plate and said support plate together, holding elements on one of said base plate and said support plate, said holding elements being spaced from one another both in longitudinal direction of said ski and also laterally thereof, a strap wound around said holding elements along its longitudinal extent, said strap being secured at one of its ends to said support plate and at its other end to said base plate, a part of said strap extending from said holding elements to a fastening point on the other of said base plate and said support plate and holding means for holding said strap normally in a tensioned condition on said holding elements and allowing release of said strap from said holding elements when said boot is released from said ski.

4,229,021

PASSENGER MOTOR VEHICLE

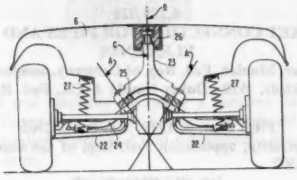
Walter Schmid, Sindelfingen, Fed. Rep. of Germany; Karl Wilfert, deceased, late of Gerlingen-Waldstadt, Fed. Rep. of Germany (by Dorothea Wilfert nee Rischawy, legal heir), by Thomas Wilfert, legal heir, Gerlingen-Waldstadt, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,418

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644870

Int. Cl.[2] B62D *31/00, 27/04*

U.S. Cl. 280—787 **21 Claims**



1. A motor vehicle comprising :

(a) chassis means with front and rear axle;

(b) vehicle body means;

(c) connecting means including at least two support column means elastically retained at least at one end and provided with upper and lower bearing support means; and

(d) wheel spring means coordinated between the chassis means and the vehicle body means;

wherein said connecting means supports the vehicle body means upon the chassis means by way of at least two support column means arranged one behind the other, transverse to the driving direction, with at least one support column means being elastically connected, at its upper end, to the vehicle body means by a substantially central upper bearing support means and being further connected, at its lower end, to the chassis means by lower bearing support means whose lines of action intersect approximately in the vertical axis of the support column means;

whereby said support column means is operable in the manner of a crank and thus the vehicle body means may move in a translatory manner with respect to the chassis means while also being capable of pivoting about an axis located substantially in the driving direction.

4,229,022

FILING FOLDER FOR PERFORATED PAPERS

Carl-Erik Grundell, Osmogatan 8, S-122 48 Enskede, Sweden

Continuation of Ser. No. 764,932, Feb. 2, 1977, abandoned, which is a continuation of Ser. No. 522,065, Nov. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 398,765, Sep. 19, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,557

Int. Cl.[3] B42F *9/00*

U.S. Cl. 281—45 **3 Claims**

1. A filing folder for perforated papers, comprising:

at least one stiff rectangular cover,

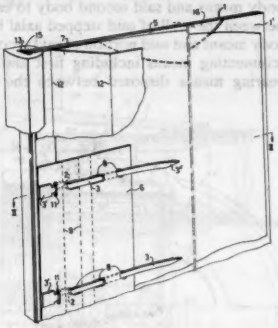
at least one elongated binding tongue of a flexible material arranged approximately perpendicular to and extending away from one edge of said cover,

a portion of said binding tongue adjacent one end thereof being secured to said cover adjacent said edge of the cover,

said one end of the binding tongue forming a laterally enlarged part,

a flap having an opening therein for receiving said enlarged part of the tongue so as to be hooked thereon between said one edge of the cover and the attached portion of the tongue with the edge of the flap flush with the free end of the laterally enlarged part of the tongue,

said flap having further openings therein for receiving the non-enlarged part of the binding tongue after it has been threaded through perforated papers,



and a channelled bar locking together said cover marginal edge, said enlarged part of the tongue and the marginal edge of the flap.

4,229,023

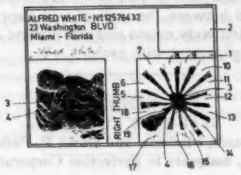
IDENTITY CHECKING DEVICE

Wilson S. Luz, Rua Alcindo Guanabara, 25/102, 20.000 Rio de Janeiro RJ, Brazil

Filed Mar. 2, 1979, Ser. No. 16,852

Int. Cl.[3] B42D *15/00*

U.S. Cl. 283—7 **15 Claims**



1. Identity Checking Device comprising a card having a region carrying an identified fingerprint of a given finger of the legitimate card holder, said fingerprint having sections cut therefrom whereby said region comprises alternate transparent and partial fingerprint zones.

4,229,024

SWIVEL CONNECTOR

David A. Oberrecht, Cincinnati, and Fred A. Wilson, Middletown, both of Ohio, assignors to Dover Corporation, New York, N.Y.

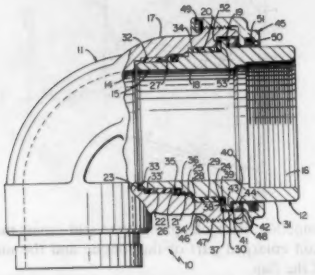
Filed Aug. 25, 1978, Ser. No. 936,829

Int. Cl.[2] F16L *17/00, 27/00, 33/16*

U.S. Cl. 285—98 **10 Claims**

1. A swivel connector including first body means; a second body; said first body means having stepped axial bore means therein; said first body means having a passage therein with one end of said passage communicating with one end of said stepped axial bore means and its other end communicating with the exterior of said first body means; said passage having a smaller diameter than the minimum diameter of said stepped axial bore means; said stepped axial bore means in said first body means having its other end communicating with the exterior of said first body means; said second body having at least a portion for disposition within said stepped axial bore

means in said first body means and in radial spaced relation thereto; said second body having a passage extending therethrough and communicating with said passage in said first body means when said portion of said second body is disposed within said stepped axial bore means in said first body means to provide a continuous passage extending through said first body means and said second body; and means to rotatably connect said first body means and said second body to each other and disposed between the wall of said stepped axial bore means in said first body means and said portion of said second body, said rotatably connecting means including first and second non-metallic bearing means disposed between the wall of said



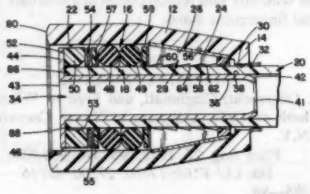
stepped axial bore means in said first body means and said portion of said second body and in engagement with each to support all bending loads, a non-metallic thrust ring disposed between said first body means and said second body to absorb thrust loads produced by relative movement of said second body into said first body means, ball bearing means disposed between said first body means and said portion of said second body to support thrust loads produced by relative movement of said second body out of said first body means, and sealing means disposed between the wall of said stepped axial bore means in said first body means and said portion of said second body and in engagement with each.

4,229,025

STAB-TYPE COUPLING

Frank R. Volgstadt, Madison, and David P. Passerell, Geneva, both of Ohio, assignors to Perfection Corporation, Madison, Ohio

Filed Apr. 25, 1978, Ser. No. 899,813
Int. Cl.[2] F16L *47/00*
U.S. Cl. 285—105 **14 Claims**



1. A stab-type coupling for connecting an end portion of a smooth wall non-metallic pipe to a fitting or another pipe, said coupling comprising in combination:

a non-metallic coupling body having a first end and an internal recess adapted to receive the end portion of a smooth wall non-metallic pipe;

a generally elongated metallic hollow insert disposed within said recess and about which the end portion of a smooth wall non-metallic pipe is adapted to be received;

at least one elastomeric seal ring disposed within said recess and adapted to sealingly engage the end portion of a smooth wall non-metallic pipe and said coupling body when said pipe is disposed within said seal ring;

a non-metallic retaining collet disposed within said recess, said collet having a tapered external surface which converges in the direction of said first end of said coupling body and a toothed internal surface adapted to engage the end portion of a smooth wall non-metallic pipe;

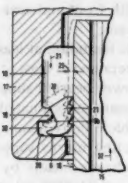
a generally frusto-conical metallic back-up ring retained by said coupling body, said back-up ring having an internal surface generally complementary to said external surface of said collet and against which said collet is adapted to bear in the event of an attempted withdrawal of said smooth wall non-metallic pipe from said coupling body.

4,229,026

SOCKET CONNECTION FOR PIPES AND PIPE ELEMENTS

Georg Seiler, Munich, Fed. Rep. of Germany, assignor to Eisenwerke Friedr. Wilh. Duker GmbH & Co., Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,565
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2829307
Int. Cl.[2] F16L *21/08*
U.S. Cl. 285—105 **8 Claims**



1. A connector for connecting pipes, which comprises a pipe having a smooth insertion end, a socket adapted to receive the pipe with radial clearance, and a seal and friction ring; the socket having in its interior a substantially radially extending end shoulder and axially spaced therefrom an annular bead so as to form an annular groove; a base portion of the ring being disposed between the shoulder and the bead and a sealing portion of the ring being situated on a side of the annular bead which is distal from the base portion, the sealing portion having embedded therein a plurality of retaining elements which are distributed in the circumferential direction and each of which has at least two serrated internal edges for acting on the circumference of the smooth insertion end and which are tiltably supported on the annular bead, the radially outwardly oriented circumferential surface of each retaining element diverging towards the sealing portion to define a divergence angle with respect to an envelope surface that contacts all internal edges of the retaining element, the circumferential surface being a sliding surface for axially slidably guiding the embedded retaining element on the annular bead while maintaining the retaining element freely tiltably supported in every axial position.

4,229,027

REMOTE AUTOMATIC MAKE-UP STAB-IN SEALING SYSTEM

Charles D. Morrill, Bellaire, Tex., assignor to McEvoy Oilfield Equipment Company, Houston, Tex.

Filed Sep. 15, 1977, Ser. No. 833,553
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—137 A **26 Claims**

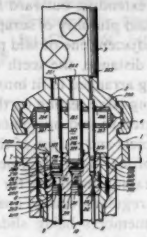
1. A sealing system, comprising:

a tubing hanger having multiple bores therethrough, said bores having substantially parallel walls;

an assembly suspended above said tubing hanger having

multiple nipples depending therefrom, each of said nipples being telescopically received in one of said bores;

a plurality of seal assemblies, one of said seal assemblies being mounted on each of said nipples;



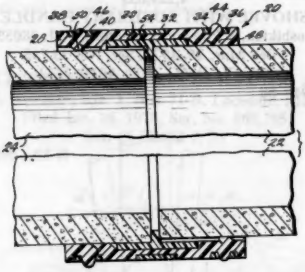
each said seal assembly including a member having seal means thereon for forming a metal-to-metal seal with said corresponding nipple and said substantially parallel walls of said bore.

4,229,028

PIPE COUPLER

Paul E. Gray, Gnadenhutten, Ohio, assignor to Universal Sewer Pipe Company, Mogadore, Ohio

Filed Dec. 20, 1978, Ser. No. 971,216
Int. Cl.[2] F16L *21/02*
U.S. Cl. 285—235 **4 Claims**



1. A coupling for connecting the adjacent ends of two pipes comprising:

a flexible sealing member having a generally cylindrical shape, an outer, central circumferentially extending groove on the outside periphery of said member, an inner circumferentially extending groove on the inside periphery of said member opposite said outer groove, first and second pairs of adjacent support grooves, each pair including first and second grooves circumferentially extending on the outside periphery of said member on either side of said outer groove, the grooves of each pair being separated by a flexible band of said member, and first and second unitary sealing lips extending radially inwardly from the inner periphery respectively opposite said bands, said lips compressing against said pipes to effect a seal and said bands displacing outwardly during connection of said two pipes;

an inner rigid center ring disposed in said inner groove and having a stop surface extending radially inward for positioning pipes to be coupled together;

an outer rigid center ring disposed in said outer groove; and

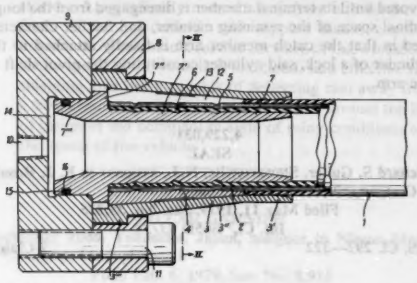
first and second pairs of rigid support rings, each pair including first and second rings disposed respectively in said first and second support grooves.

4,229,029

HOSE COUPLING

Jean-Jacques, deceased Boyer, late of Montchauvet, and Pascal by Boyer, heir, Rue Freneaux, Montchauvet, Yvelines, France

Filed Jul. 17, 1978, Ser. No. 925,205
Claims priority, application France, Jul. 18, 1977, 77 21904
Int. Cl.[2] F16L *33/22*
U.S. Cl. 285—242 **3 Claims**



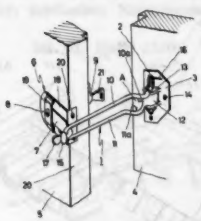
1. A coupling for reinforced hose with reinforcement metallic sleeve comprising a fixation collar formed with a tapered inner surface, an assembly clamp to which the fixation collar is to be attached, a plurality of jaws in the shape of tapered sectors engageable in and spaced around the collar with the outer surfaces of the jaws in contact with the inner face of the fixation collar while leaving a clearance between two successive jaws, the inner surfaces of said jaws forming a substantially cylindrical surface for surrounding the outer surface of the hose to be connected, and a cylindrical sleeve having a portion engageable inside the hose to be connected and formed with a tip portion, the assembly clamp having a coaxial bore in which said tip portion of said cylindrical sleeve slides and which forms a pressure chamber so as to form with said tip a differential piston, the cylindrical sleeve having a flange which comes to bear against the end face of the jaws in response to a differential pressure to drive the sleeve toward the jaws so that the flange of the sleeve drives the tapered sectors further into the fixation collar to increase the grip on the hose between the fixation collar and the cylindrical sleeve.

4,229,030

SAFETY DOOR FASTENING

Francisco J. Tarragona Corbella, Urgell 143, Barcelona, Spain

Filed Jan. 22, 1979, Ser. No. 5,086
Claims priority, application Spain, Jan. 31, 1978, 467.065
Int. Cl.[3] E05C *17/24*
U.S. Cl. 292—270 **7 Claims**



1. A safety door fastening of the type for limiting the angle of opening of a door and comprising on the one hand a rigid retaining member defining a longitudinal space and being pivotably attached to a vertical pin located on the door frame and on the other hand a catch member mounted to the door,

comprising an arm having a terminal member adapted to slide in the longitudinal space of the retaining member and hold it, characterized in that the arm of the catch member is adapted for pivoting around a horizontal axis by operation of a lock means operable from the outside of the door, the retaining means having resilient means biasing it against the inner face of the door when the door is in the closed position thereof and said retaining member also having means which, in the closed position of the door, allow the arm of the catch member to be pivoted until its terminal member is disengaged from the longitudinal space of the retaining member, and further characterized in that the catch member arm is fixedly attached to the cylinder of a lock, said cylinder constituting the pivot shaft of the arm.

4,229,031

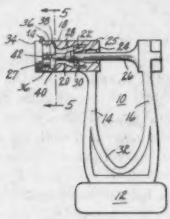
SEAL

Richard S. Guiler, Stewartsville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed May 11, 1979, Ser. No. 38,325

Int. Cl.[3] B65D *33/34*

U.S. Cl. 292—322 **7 Claims**



1. A seal comprising housing open at both ends and a shackle, said housing and a shackle end having means for locking engagement when the shackle end is inserted into one end of the housing, and means for closing the other end of the housing, comprising a plug having a base for covering said other end and resilient legs for extending into said other end, and means in the housing engaging said legs and preventing withdrawal thereof.

4,229,032

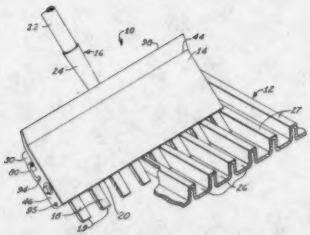
UNIVERSAL IMPLEMENT FOR CLEANING CORRUGATED SURFACES

Michael R. Murphy, Louisville, Ky., assignor to The Murphy Advantage Corporation, Louisville, Ky.

Filed Mar. 9, 1979, Ser. No. 19,102

Int. Cl.[3] A01B *1/20*

U.S. Cl. 294—51 **16 Claims**



1. An improved hand manipulable implement for cleaning a surface of the type having essentially straight, parallel, and regularly spaced apart channels and ridges, said implement being of the type having an elongate handle, a generally planar blade, means for attaching the handle to the blade in general coplanar relationship therewith, the blade including a first working edge perpendicular to the handle and oppositely disposed on the blade from the handle, and a plurality of scraping members attached to the blade, each of said scraping members including a tooth extending outward from the first working edge, each one of said plurality of scraping members being spaced apart from an adjacent one of said plurality of scraping members by an equal distance, the teeth of said plurality of scraping members being arranged to fit into the channels of the surface, the first working edge resting on the ridges, where by shoveling action imparted to said implement foreign matter is scraped from the channels and ridges of the surface, wherein the improvement comprises: means intermediate adjacent ones of said plurality of scraping members for resiliently holding said scraping members regularly spaced apart, each one of said plurality of scraping members being slidable laterally with respect to the blade along the first working edge under constraint of said holding means, whereby during the shoveling action and in response to an irregularity of a corresponding one of the channels in which the tooth of said one scraping member fits, said one scraping member is moved laterally to accommodate the irregularity and prevent binding of the teeth of said plurality of scraping members in the channels.

4,229,033

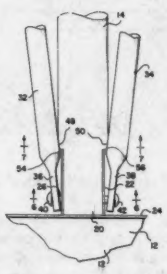
SHOVEL WITH AUXILIARY HANDLE

Michael Vosbikian, 3 Pinecrest, Medford, N.J. 08055

Filed Mar. 26, 1979, Ser. No. 23,735

Int. Cl.[3] B65G *3/00*; A01B *1/22*

U.S. Cl. 294—58 **8 Claims**



1. In a shovel of the type including a blade, a rearwardly open socket affixed to the blade and a first handle having its forward end secured within the socket, the improvement comprising

a second handle adapted to pivot relative to the first handle about a pivotal connection,

said second handle being movable from an aligned position in substantial alignment with the first handle to pivoted positions not in substantial alignment with the first handle;

pivot pin means positioned in a forward portion of said first handle to pivotally connect the second handle to the first handle; and

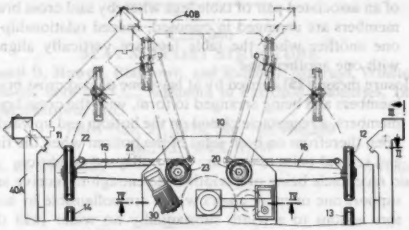
frictional engagement means frictionally engaging a lower portion of the second handle to releasably secure the second handle to the first handle when the second handle is moved to its said aligned position.

4,229,034

DEVICE FOR THE ROTATION OF CONTAINERS

Oscar Zinno, Genoa-Quinto, and Antonio Tocchella, Genoa-Pegli, both of Italy, assignors to Costruzioni Meccaniche Industriali Genovesi C.M.I. S.p.A., Genoa-Fegino, Italy

Filed Oct. 11, 1978, Ser. No. 950,303
Claims priority, application Italy, Nov. 23, 1977, 12850 A/77
Int. Cl.[3] B66C *1/62*
U.S. Cl. 294—81 SF 6 Claims



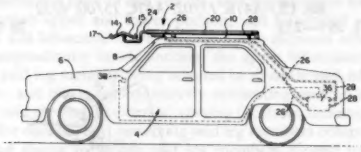
1. In a device for rotating containers, the improvement comprising a central body, four orientable arms pivotally mounted on said central body to swing about parallel vertical axis relative to said central body, a pulley mounted on each of said arms for pivotal movement about a vertical axis, said pulleys receiving support ropes coming down from a carriage arranged above and sliding on the main bar of a crane, means for keeping said pulleys parallel to themselves during the orienting movement of said arms, and a lower catching frame rotatably supported by said central body for rotation about a vertical axis and connected to a spreader.

4,229,035

VEHICLE WINDSHIELD RAIN DEFLECTOR SYSTEM

Joseph W. Newman, Rte. 1, Box 71-B, Lucedale, Miss. 39452

Filed Jan. 16, 1978, Ser. No. 869,795
Int. Cl.[2] B60J *1/20*
U.S. Cl. 296—95 R 19 Claims



1. A windshield rain deflector system for use on a vehicle movable at a significant rate of speed having a transparent windshield through which an occupant of the vehicle has a particular, forward, desired line of vision when riding in the moving vehicle, comprising:

at least one rain deflector shield defining an effective rain shielding area, which defined shielding area is movable through a series of operative dispositions each located in front of the windshield at longitudinally spaced locations from the others and located above at least most of the windshield;

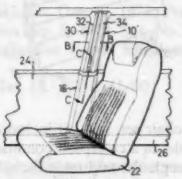
support means for mounting the system on the vehicle and for carrying said shield and allowing said effective shielding area to move among its various operative dispositions, said shield(s) and said support means further defining an open, variable air pressure release area between said shield and the upper portions of the vehicle body and windshield, said air pressure release area becoming greater in size as the effective shield area is moved further forward and away from the windshield in its operative dispositions preventing extreme compression of air underneath said shield(s) as the vehicle moves forward at a significant rate of speed, the location of said effective shielding area being determined based at least in part on the forward speed of the vehicle, said movable effective shielding area and said variable air pressure release area being provided by means of a shield movable out and spaced away from the windshield by said support means, said pressure release area being defined by the ever increasing longitudinal separation space between said shield and the windshield as the shield is longitudinally moved away from and further in front of the windshield, said support means enabling movement of said shield further forward of the windshield as the speed of the vehicle is increased, said effective rain shielding area being capable of deflecting rain away from a free, clear vision zone on the windshield around the line of vision of the occupant in spite of rainy conditions and the speed of the vehicle.

4,229,036

PILLAR GARNISH

Tadayoshi Toda, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 6, 1979, Ser. No. 9,915
Claims priority, application Japan, Feb. 10, 1978, 53-16775
Int. Cl.[3] B62D *33/00*
U.S. Cl. 296—202 9 Claims



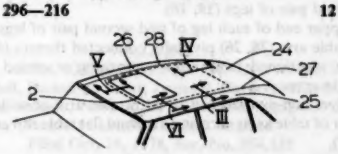
1. In a vehicle body pillar garnish made up of two individual pillar garnish members and having a seam mark formed by the mating edge portions of said pillar garnish members, the improvement being in that one of the mating edge portions of said pillar garnish members is formed with a step which cooperates with the other of said mating edge portions to form a recess having at least two bottom corners, one of which coincides with said seam mark.

4,229,037

VEHICLE, PROVIDED WITH A SLIDING ROOF ASSEMBLY

Theodorus H. Vermeulen, Heemstede, Netherlands, assignor to Vermeulen-Hollandia Octrooien B.V., Haarlem, Netherlands

Filed Mar. 8, 1979, Ser. No. 18,792
Claims priority, application Netherlands, Dec. 15, 1978, 7812198
Int. Cl.[3] B62D *25/06*
U.S. Cl. 296—216 12 Claims



1. A vehicle, in particular a motor-car, provided with a sliding roof assembly comprising a sliding panel which is mounted in a frame so as to be movable forward and backward, and which closes a ventilating opening in its forward position and releases this ventilating opening in its opened position, while a roof plate, fastened on the frame, forms a covered

portion behind this ventilating opening underneath which the sliding panel extends at least partly when in its opened position, whereby the assembly consisting of the frame, the sliding panel and the roof plate is inserted from above into a substantially rectangular opening in the vehicle roof and is connected on the vehicle roof by means of a peripheral supporting rim of this assembly, while the upper side of this assembly is provided with a cover, and the supporting rim of the assembly is at least substantially flat in the direction perpendicular to the adjacent edge of the opening in the vehicle roof, the cover of the assembly extending beyond the outer circumference of the peripheral supporting rim onto the roof of the vehicle.

4,229,038

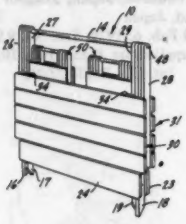
PORTABLE FOLDING TABLE AND CHAIRS

Edward J. Drost, 8101 Kenneth, Skokie, Ill. 60076

Filed Aug. 16, 1978, Ser. No. 934,024

Int. Cl.³ A47B *39/00*

U.S. Cl. 297—139 **1 Claim**



1. A table and chair set, said set including, in combination
a table, said table, in a collapsed condition, also functioning as a chair receptacle, said table including,
a first pair of legs (**19, 17**), the upper end of each leg of said first pair of legs having
a table arm (**29, 27**) pivotally connected thereto (**49**), said table arms comprising a first pair of table arms,
the free, non-pivoted end of each table arm of said first pair of table arms carrying a first flat table top sub-assembly (**31**),
a combined carrying and connecting rod (**14**) pivotally connected to, and extending between, the upper, pivoted end of each said first legs and the pivoted end of each associated table arm, the axis of the carrying/connecting rod being co-axial with the pivot axis at the pivot joinder of each leg of said first pair of legs and its associated table arm,
whereby said combined carrying and connecting rod functions as a carrying handle for the table and chair set when the table is in a collapsed condition, and as a connecting rod which maintains the two table arms associated with the first pair of legs in a connected, but spaced, position with respect to one another in an erected condition,
a second pair of legs (**18, 16**),
the upper end of each leg of said second pair of legs having a table arm (**28, 26**) pivotally connected thereto (**48**), said just mentioned table arms comprising a second pair of table arms,
the free, non-pivoted end of each table arm of said second pair of table arms carrying a second flat table top assembly (**30**),
leg pivot connecting means (**20, 15**),
each of said leg pivot connecting means connecting one of said first legs to one of said second legs,
whereby said legs are connected, in pairs, about a common pivot axis, (**20**)
the two table legs and the two table arms at each end of the set being axially offset with respect to each other whereby said pairs of arms and legs at each end of the table formed by the abutment of the two table sub-assemblies swing in vertical, non-intersecting planes, (**FIG. 6**),
the end edge portions of each table sub-assembly being supported by at least a portion of the pivotally connected table arm and table leg structure associated with the other table sub-assembly,
a cross brace member (**23, 24**) extending between and connected to the lower end of each of the pair of table legs associated with each of the table top sub-assemblies,
each cross brace member being located on the exterior side of an associated pair of table legs whereby said cross brace members are arranged in opposed, spaced relationship to one another when the table legs are vertically aligned with one another, and
closure means (**25**) carried by at least one of said cross brace members and being arranged to form, with the cross brace members, a receptacle closed on the bottom and upwardly open therefrom on both sides of the bottom when the first and second pairs of legs are in a collapsed condition,
said receptacle being of a width wide enough to receive and support one or more chairs which are collapsible by scissors actions to a width substantially no wider than the width of the legs and seat surface thereof, (**FIG. 9**),
said carrying/connecting rod being located at the upper end portion of the collapsed table and the receptacle at the lower end portion of the collapsed table to thereby provide maximum access to the receptacle, and
one or more chairs (A, B, C, D) formed and adapted to be collapsed to a width less than the width of the receptacle whereby it may be inserted from the top region downwardly into the receptacle, when either, or both, of table sub-assemblies (**31, 30**) are swung away from their downwardly collapsed position.

4,229,039

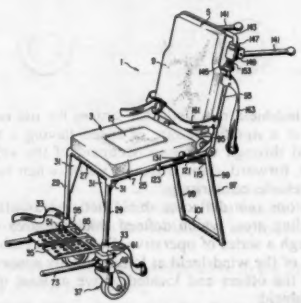
INSERT TRAVEL CHAIR AND METHOD OF TRANSPORTING THE HANDICAPPED

Frederick L. Day, Rte. 2, Box 78, Ladson, S.C. 29456

Continuation-in-part of Ser. No. 800,434, May 25, 1977, Pat. No. 4,113,307, and a continuation-in-part of Ser. No. 680,766, Apr. 27, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,253

Int. Cl.² A47K *11/02*; A47C *15/00, 4/52*

U.S. Cl. 297—232 **28 Claims**



1. A foldable insert travel chair comprising:
(a) a seat having a front and rear,
(b) a back pivotally attached to the rear of said seat, said back being pivotable forwardly from an upright position and rearwardly to a collapsed position relative to said seat, wherein said back is positioned substantially under said seat,
(c) means for latching said back in a position wherein said back may be locked in the upright, non-pivoting position and unlocked into the pivotable position,

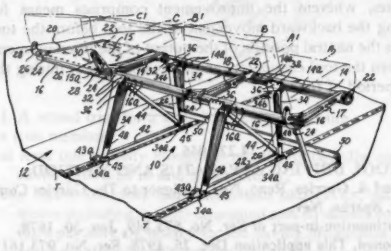
(d) wheel means connected to the chair,
(e) the area under the rear of said seat being substantially unobstructed whereby said seat may be positioned over a conventional seat,
(f) leg means extending downwardly from and pivotally connected to the rear of said seat, said leg means being movable from a ground engaging position to a position substantially under said seat,
(g) handle means extending from said back for moving the chair from place to place.

4,229,040

SEAT SUPPORT STRUCTURE

Russell B. Howell, Pfafftown, and Ralph G. Marrujo, Winston-Salem, both of N.C., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed Nov. 27, 1978, Ser. No. 964,269
Int. Cl.[2] A47C *1/00*
U.S. Cl. 297—355 **8 Claims**



1. Supporting means for vehicle seats having seat cushions and locatable in a vehicle with a floor comprising in combination a pair of tubular members located to be horizontally disposed beneath the seat cushions of the seat, a plurality of spacing members operatively connected to said tubular members and adapted to maintain said tubular members in a fixed spaced relationship, a pair of leg members fastened to each of said tubular members to support said tubular members a fixed distance above the floor of the vehicle, said leg members having a bifurcated upper and lower portion, said bifurcated upper portion and bifurcated lower portion being disposed substantially perpendicular to one another, the upper bifurcated portion of said leg member being adapted to straddle said tubular member, and means for operatively connecting said leg members to said tubular members at varying locations thereon, said means for operatively connecting said leg members comprising fastening means to secure said leg members to said tubular members.

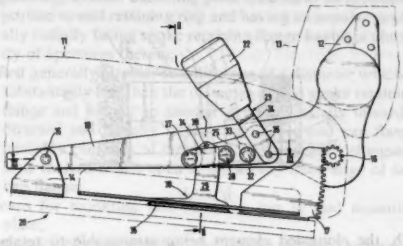
4,229,041

ANCHORING ARRANGEMENT FOR SAFETY BELTS IN A MOTOR VEHICLE

Paul Werner, Remscheid, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,310
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1978, 2802616
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—468 **7 Claims**

1. In an anchoring arrangement for a safety belt of an adjustable vehicle seat having a seat frame, a guide rail assembly secured to the vehicle body and incuding a longitudinally adjustable guide rail and a vertical adjuster provided between the guide rail and the seat frame, a combination comprising a support member secured to said longitudinally adjustable guide rail and including a clamping arm projecting upwardly to said seat frame; a clamping lever pivotably connected to said seat frame and having one arm secured to the safety belt, the other arm of said lever supporting clamping means normally slidably engaging two opposite sides of said clamping arm and



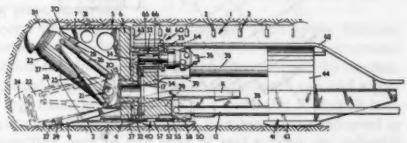
being adapted for locking the clamping lever to the clamping arm when an excessive force is applied to the safety belt.

4,229,042

EXCAVATING MACHINES

Derek Plummer, Burton upon Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Division of Ser. No. 621,374, Oct. 10, 1975, Pat. No. 4,136,910.
This application Sep. 8, 1978, Ser. No. 940,699
Claims priority, application United Kingdom, Oct. 30, 1974, 46943/74
Int. Cl.[2] E21C *41/00*
U.S. Cl. 299—18 **7 Claims**



1. The method of excavating for forming an underground roadway at least a part of a rock boundary of which is of arcuate form comprising supporting a rotating cutter on one end of a boom, supporting another end of the boom on a pivot means, supporting the pivot means on a forward end of a boom support member, securing the boom at a predetermined angle to the pivot means and rotating the boom support on an axis extending along the longitudinal axis of the roadway; thereby rotating the pivot means on the axis of the boom support member and rotating the cutter in an arc having a center on an extended axis of the boom support member.

4,229,043

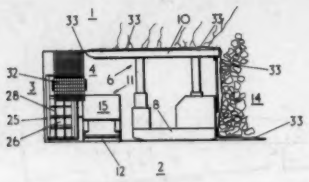
COWL ARRANGEMENTS FOR MINING MACHINES

Roy L. Bell, Burton-on-Trent; James B. Garner, Mansfield, and Douglas Salmon, Newark, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 24, 1978, Ser. No. 954,155
Int. Cl.[2] E21D *19/02*
U.S. Cl. 299—33 **6 Claims**

1. A cut mineral loading arrangement for a mining machine which includes a cutter head and which in use traverses along a path cut by the machine, comprising a cut mineral loading member mountable adjacent to the rear of the cutter head which in association with said loading member urges cut mineral towards conveyor means, and a bracket which is at least

partly pivotally supported with respect to said loading member for paying out an elongated element extending along the cut



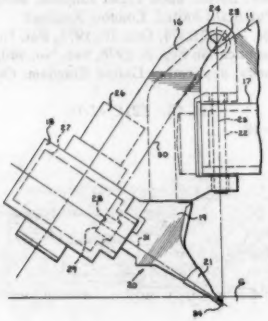
path, the elongated element being arrangeable to retain or contain mine roof material.

4,229,044

CLEVIS-MOUNTED IMPACT RIPPER

Delwin E. Cobb, and Richard E. Livesay, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 12, 1979, Ser. No. 31,560
Int. Cl.[3] A01B *35/00*
U.S. Cl. 299—37 **14 Claims**



1. In a ripper assembly (10) having a beam (11) adapted to be secured to an earthworking machine, a clevis pivot pin (22) mounted to said beam to define a vertical pivot axis (23), am impact breaker mechanism (18), a shank (19) provided with a shank pivot pin (25), a ripper tip (21) defining a ripper tip axis (31), and a bracket (16) pivotally mounted to the clevis pivot pin (22) and carrying the impact breaker mechanism (18) to apply an impact force to the shank (19) urging the ripper tip (21) about the axis (24) of the shank pivot pin (25), the improvement comprising

means on said bracket (16) for mounting said shank pivot pin (25) to define a horizontal pivot axis (24) substantially intersecting said clevis pivot pin vertical axis (23).

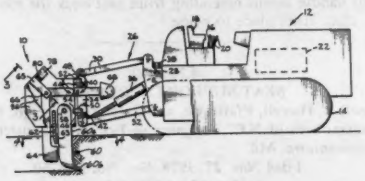
4,229,045

RESONANT TOOL DRIVING APPARATUS WITH TOOL STOP

Raymond A. Gurries, Reno, Nev., assignor to The Gurries Company, Sparks, Nev.

Continuation-in-part of Ser. No. 905,372, May 12, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 973,187
Int. Cl.[2] E01C *23/09*
U.S. Cl. 299—37 **5 Claims**

1. A material working machine having a tool holder, a tool movably attached to the tool holder and adapted to move forward and backward relative to the tool holder along a work path, a resonant member mounted on the tool holder, the resonant member having an output backwardly spaced from the tool and an input, means for rigidly supporting the resonant member with respect to the tool holder as to all motion except resonance, means remote from the supporting means for applying an oscillatory, resonance causing force to the input of the resonant member for a given period of time to cause the output to oscillate forward and backward relative to the tool holder about a neutral position and to strike the tool on forward oscillations, and means for applying a unidirectional force to



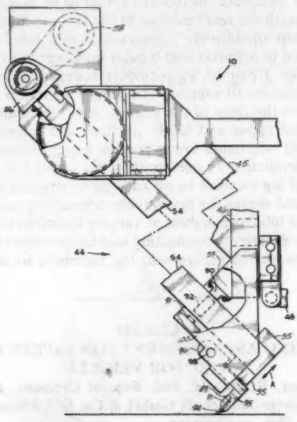
the tool holder for the given period of time to advance the tool intermittently along the work path as the resonant member resonates, wherein the improvement comprises means for stopping the backward movement of the tool before the tool reaches the neutral position of the output of the resonant member when the tool encounters an immovable object during the given period of time.

4,229,046

TOOL DRIVING APPARATUS AND METHOD

Raymond A. Gurries, Reno, Nev., assignor to The Gurries Company, Sparks, Nev.

Continuation-in-part of Ser. No. 873,249, Jan. 30, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 973,161
Int. Cl.[2] E21C *37/20;* **E01C** *23/09*
U.S. Cl. 299—37 **6 Claims**



1. A material working machine having a tool holder, a tool adapted to move freely relative to the tool holder along a work path, a resonant member supported by the tool holder, the resonant member having an output coupled to the tool and an input, means attached to the tool holder for applying an oscillatory, resonance causing force to the input of the resonant member for a given period of time, and means for applying a unidirectional force to the tool holder for the given period of time to advance the tool intermittently along the work path as the resonant member resonates, the oscillatory force being sufficiently larger than the maximum value of the unidirectional force to overcome the unidirectional force and to drive the resonant member back, thereby preventing cessation of

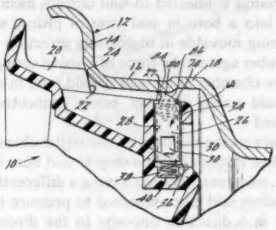
resonance, when the tool is unable to advance responsive to the unidirectional force and the oscillatory force.

4,229,047

WHEEL TRIM RETENTION SYSTEM

Hans R. Beisch, Amherstburg, Canada, assignor to Norris Industries, Inc., Ypsilanti, Mich.

Filed Jul. 21, 1977, Ser. No. 817,629
Int. Cl.³ B60B *7/06*
U.S. Cl. 301—37 P **34 Claims**



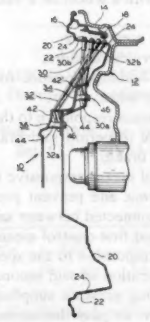
1. A wheel trim for a vehicle wheel comprising
a trim member;
at least one radially elongated radially outwardly opening cavity provided in said trim member;
clip means movably disposed within said cavity, said clip means including radially elongated spaced sidewalls defining a partially enclosed area and having projections cooperating with sidewall portions of said cavity so as to limit movement of said clip with respect to said cavity;
a toothed portion provided on said clip means;
flange means positioned between said sidewalls; and
biasing means engaging said flange means and urging said clip means radially outwardly from said cavity through said opening and urging said toothed portion into biting engagement with a portion of a vehicle wheel when said trim member is installed thereon so as to retain said trim member in position thereon.

4,229,048

WIRE WHEEL COVER

Thomas F. Brinson, Lake Park, Ga., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 6, 1979, Ser. No. 27,666
Int. Cl.² B60B *7/00*
U.S. Cl. 301—37 SS **7 Claims**



1. A simulated wire wheel cover for attachment to the outer face of a vehicle wheel, said cover comprising, in combination:
a retaining ring having a plurality of retention clips fastened to the outer margin thereof for bitingly engaging said vehicle wheel;
a generally circular mounting plate secured at its peripheral portion to said retaining ring and having an annular generally radially facing spoke retaining flange having a plurality of apertures therein;
a first generally circular retaining cap of a diameter which is substantially less than the diameter of said spoke retaining flange and having an annular generally axially inwardly directed and radially facing cap flange, said cap flange having a plurality of circumferentially spaced elongated slots therein which open at the axially inner edge of said cap flange;
means for mounting said retaining cap to said mounting plate;
a plurality of spoke members each spoke member comprising an elongated member having a looped central portion the diameter of which is greater than the circumferential width of said slots and a pair of legs extending therefrom in a generally V-shaped configuration, each of said spoke members being mounted in respective ones of said slots of said first cap wherein the loop portions thereof are disposed radially inwardly of said slots and wherein the free ends of said legs project through said slots, generally radially outwardly from said cap flange, and through a corresponding pair of said apertures of said mounting plate;
a second generally circular retaining cap of a diameter which is substantially less than the diameter of said first cap and having an annular generally axially inwardly directed and radially facing cap flange with said second cap flange having a plurality of circumferentially spaced elongated slots which open at the axially inner edge of said second cap flange;
means for mounting said second retaining cap to said mounting plate; and,
a second plurality of spoke members each spoke member comprising an elongated member having a looped central portion the diameter of which is greater than the circumferential width of said slots of said second cap and a pair of legs extending therefrom in a generally V-shaped configuration, each of said spoke members being mounted in respective ones of said slots of said second cap wherein the loop portions thereof are disposed radially inwardly of said slots and wherein the free ends of said legs project through said slots of said second cap, generally radially outwardly from said flange of said second cap, and through a corresponding pair of said apertures of said mounting plate.

4,229,049

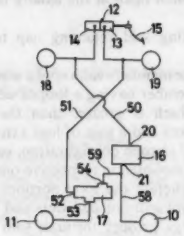
HYDRAULIC PRESSURE CONTROL SYSTEM FOR SPLIT BRAKE SYSTEM

Masamoto Ando, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 4, 1978, Ser. No. 948,485
Claims priority, application Japan, Oct. 4, 1977, 52-119244; Oct. 4, 1977, 52-119245
Int. Cl.² B60T *8/02, 8/26*
U.S. Cl. 303—6 C **5 Claims**

1. A hydraulic pressure control system for a split brake system which comprises:
a tandem master cylinder having first and second hydraulic pressure sources;
at least first and second rear wheel cylinders;
a first brake pressure supply line communicating said first source with said first rear wheel cylinder;
a second brake pressure supply line communicating said second source with said second rear wheel cylinder;
a first hydraulic pressure control device positioned within said first supply line for controlling output hydraulic pressure transmitted therefrom with respect to hydraulic pressure transmitted from said first source; and

a second hydraulic pressure control device including a housing positioned within said second supply line and including a balance piston mounted in said housing and a first passage formed in said housing for controlling output hydraulic pressure transmitted therefrom with respect to input hydraulic pressure transmitted from said second source in response to output hydraulic pressure transmitted from said first control device, said second hydraulic pressure control device further including a by-pass passage formed in said housing, a second piston disposed within said housing, one end thereof receiving hydraulic



pressure from said first source and the other end thereof receiving hydraulic pressure transmitted through said valve means which is normally open by said balance piston and second valve means disposed within said first passage such that said first passage is normally open for passing fluid between said valve means and said second supply line such that said second valve means also normally closes said by-pass passage and, upon failure of said supply line, said second valve means opens said by-pass passage and, at the same time, interrupts communication between said first passage and said balance piston.

4,229,050

BRAKE FORCE REGULATOR FOR A MOTORCYCLE HYDRAULIC BRAKE SYSTEM

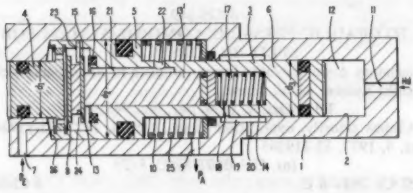
Klaus Engert, Buerstadt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 27,980

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822933

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **4 Claims**



1. A brake force regulator for a motorcycle brake system comprising:

a housing having a longitudinal stepped bore;

a fluid inlet chamber connected to a pedal-actuated master cylinder of a rear-wheel brake circuit disposed in said bore;

a fluid outlet chamber connected to a rear-wheel brake of said rear-wheel brake circuit disposed in said bore spaced from said inlet chamber;

a control piston slidably sealed to said bore, said control piston having first, second and third stepped sections in that order, adjacent ends of said first and second sections being associated with said inlet chamber and adjacent ends of said second and third sections being associated with said outlet chamber, said control piston being responsive to pressure from a hand-actuated master cylinder of a front-wheel brake circuit applied to an end of said third section remote from said second section to control pressure applied to said rear-wheel brake;

a fluid passageway disposed in said control piston interconnecting said inlet and outlet chambers;

a closure member for said passageway disposed in said inlet chamber;

a closure piston connected to said closure member and extending into a bore in said control piston, said closure piston being movable in the closing direction of said closure member against the force of a valve spring contained in a valve chamber at the end of said bore in said control piston, said valve chamber being connected to atmosphere; and

a weak return spring disposed in said outlet chamber to urge said control piston against a stop in said bore in said inlet chamber, said control piston having a differential effective area adjacent said stop subjected to pressure in said inlet chamber in a direction opposite to the direction of the force of said return spring to cause displacement of said control piston in the direction of said outlet chamber.

4,229,051

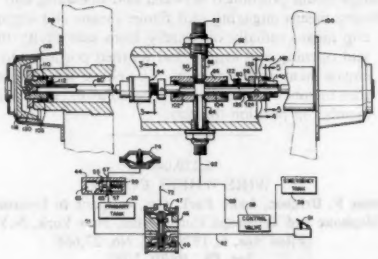
ANTI-LOCKING SYSTEM

George Mekosh, Jr., Warrington, and David O. Hulse, Lionville, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Sep. 5, 1978, Ser. No. 939,179

Int. Cl.² B60T *8/093*

U.S. Cl. 303—99 **10 Claims**



1. In combination with a wheel on a vehicle, having a brake associated therewith,

an anti-lock system comprising:

(a) a source of service pressure,

(b) a source of braking pressure for applying braking pressure to said wheel,

(c) first control means responsive to the application of said service pressure to permit said braking pressure to be applied to said brake,

(d) second control means responsive to pressure changes adapted to permit and prevent pressure from passing therethrough connected between said source of service pressure and said first control means, and

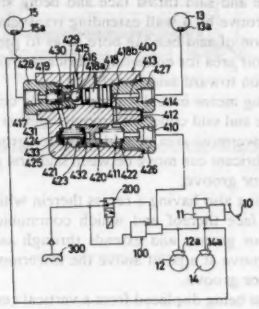
(e) valve means responsive to the speed of said wheel to control the operation of said second control means by altering operating pressure supplied thereto to permit service pressure to pass therethrough during normal braking operations and to prevent service pressure from passing therethrough when the deceleration of said wheel exceeds a predetermined rate to thereby prevent braking pressure from being applied to said wheel.

4,229,052

HYDRAULIC PRESSURE CONTROL SYSTEM FOR SPLIT BRAKE SYSTEM

Toshiyuki Kondo, Anjo, and Masamoto Ando, Toyota, both of Japan, assignors to Aisin Seiki Company, Limited, Kariya, Japan

Filed Jan. 9, 1979, Ser. No. 2,179
Claims priority, application Japan, Jan. 26, 1978, 53-7635
Int. Cl.[3] B60T 8/10, 8/26
U.S. Cl. 303—115 8 Claims



1. A hydraulic pressure control system for a split brake system comprising:

a tandem master cylinder;

first and second wheel brakes;

a first braking line between one of said tandem master cylinders and said first wheel brake;

a second braking line between the other of said tandem master cylinders and said second wheel brake;

an anti-skid actuator positioned within said first braking line to thereby decrease and increase braking fluid pressure transmitted to said first wheel brake in response to rotational conditions of wheels, and

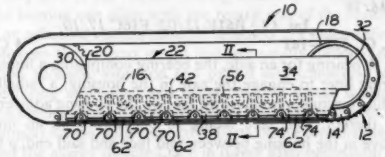
a control valve assembly positioned downstream of said anti-skid actuator communicating with said first braking line between said anti-skid actuator and said first wheel brake at a first side thereof, and communicating with said second braking line at a second side thereof, said control valve assembly comprising normally open valve means interrupting said second braking line when fluid pressure within said first braking line attains a predetermined value, and balance piston means being balanced by means of fluid pressures transmitted to said first and second wheel brakes, respectively, to thereby maintain said fluid pressures of said first and second wheel brakes at the same magnitude.

4,229,053

TRACK GUIDE ASSEMBLY

Lawrence R. Cline, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 27, 1978, Ser. No. 881,268
Int. Cl.[3] B62D 55/14
U.S. Cl. 305—28 12 Claims



1. In a track frame assembly which comprises an endless track passing over a plurality of roller means and an idler and being driven by sprocket means, an improvement comprising:

a track roller frame having a generally U-shaped cross-section defined by a pair of parallel rails and a joining bridge, said frame being supported adjacent opposite ends thereof adjacent said sprocket means and said idler and being positioned generally above said roller means;

a pair of side panels integral with said track roller frame and spaced laterally outwardly from said parallel rails, said side panels each extending downwardly to respective lower portions thereof at a level defined by said endless track;

a plurality of bars located adjacent and generally parallel to the opposite sides of said endless track to provide a guide for the movement thereof; and

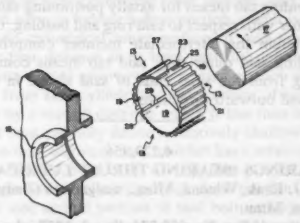
means for removably securing said bars to said track roller frame.

4,229,054

MULTI-PAD COMPLIANT HYDRODYNAMIC JOURNAL BEARING

William H. Miller, Jr., Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,261
Int. Cl.[3] F16C 32/06, 27/02
U.S. Cl. 308—9 11 Claims



1. A compliant hydrodynamic fluid journal bearing comprising:

a bearing sleeve having a cylindrical bore therein;

a rotatable shaft received within said bore and defining a gap between the wall of said bore and the surface of said shaft;

a plurality of bearing modules received within said gap and circumferentially spaced around said wall of said bearing sleeve, and attached thereto against rotation relative to said bearing sleeve;

each of said modules including a bearing sheet having a radially inwardly facing bearing surface and a resilient support element having spaced resilient projections for supporting a bearing sheet for resilient deflection under load variations exerted by said shaft;

said bearing sheet being attached adjacent one end thereof to one end of said resilient support elememt with a spacer element connected to said ends;

the other end of said bearing sheet having a portion underlying portions of the adjacent module to restrain said bearing sheet other end from lifting radially inward toward said shaft while permitting relative circumferential movement of said bearing sheets and said resilient support elements;

whereby said bearing includes bearing surface interruptions where said bearing sheet portion underlies said adjacent module portions to interrupt incipient half-speed whirl and said bearing sheet is radially restrained from wrapping around said shaft so that start-up torque for said shaft is held to a low value, and said shaft is free to rotate in either direction with respect to said bearing sheets.

4,229,055
VIBRATION-ABSORBING ANTIFRICTION BEARING, ESPECIALLY FOR A DRIVESHAFT OF A MOTOR VEHICLE

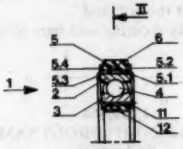
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,357

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 7817917[U]

Int. Cl.³ F16C *27/06*

U.S. Cl. 308—26 **12 Claims**



1. In a vibration-absorbing antifriction bearing having an outer bearing ring, a resilient bushing coaxial with and radially outwardly of said outer bearing ring, and an intermediate member between said outer ring and bushing and having radially extending tab means for axially positioning said intermediate member with respect to said ring and bushing; the improvement wherein the intermediate member comprises a sleeve surrounding said outer ring, said tab means comprising tabs extending from the axial ends of said sleeve in the radially inward and outward directions.

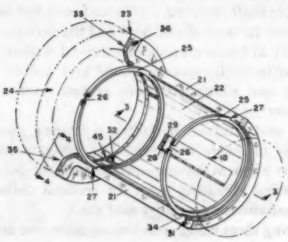
4,229,056
BEARINGS (BEARING THRUST LUBRICATION)

Richard J. Renk, Winona, Minn., assignor to Gladys D. Miller, Winona, Minn.

Continuation of Ser. No. 830,074, Sep. 2, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 14,944

Int. Cl.³ B61F *17/06*

U.S. Cl. 308—99 **4 Claims**



1. A bearing for use with an assembly wherein a rotatable member can be carried on a somewhat horizontally disposed shaft to reduce lubricant losses through said bearing comprising,

a bearing body having an arcuate bearing surface defining an axial sleeve bore portion adapted to engage a surface of said shaft with said bore having its axial centerline extending somewhat horizontally with the axis of rotation of said shaft,

said bearing having a window opening therein through which lubricant can be introduced to said shaft,

a radially projecting thrust face at an end of said bearing which is adapted to engage a thrust surface,

said bearing body having a first groove formed circumferentially in the periphery of said bearing surface into which said rotatable member can extend when mounted for rotation with said shaft, said first groove being spaced axially outwardly from said window and located between said window and said thrust face,

said bearing body also having a confined collector groove in the periphery of said bearing surface having a lowermost area below said bearing surface in which a lubricant may collect,

said collector groove being positioned between said first groove and said thrust face and being spaced from said first groove by a wall extending transversely to the axial direction of said bearing bore so as to provide a positive reservoir area for collecting lubricant draining in an axial direction toward said thrust face,

connecting means in said wall operatively coupling said first groove and said collector groove together in proximity to said lowermost area of said collector groove so some of said lubricant can move between said first groove and said collector groove,

said bearing also having a recess therein which opens at the thrust face thereof and which communicates with said collector groove and extends through said wall to said first groove at a point above the lowermost point of said collector groove,

said recess being displaced from a vertical centerline passing through said rotational axis of said shaft and above said lowermost point of said collector groove, and

lubricant transfer means in said recess for receiving and moving lubricant from both said first groove and collector grooves toward the thrust face for use in lubricating the thrust face,

said lubricant transfer means having a main leg in said recess and an offset leg which extends circumferentially in said collector groove toward said connecting means between said first and said collector grooves to gather lubricant therefrom and move it to said main leg for use in providing lubricant to said thrust face,

said main leg also having a portion exposed to said recess area in said wall between said collector groove and said first groove to enable said main leg to receive lubricant from said first groove and said rotatable member during rotation of said member by said shaft,

said main leg extending at an angle to said offset leg and terminating short of intersecting or overlaping said window opening.

4,229,057
BEARINGS

Ronald N. Howse, Waltham St. Lawrence, Nr. Reading, England, assignor to Vandervell Products Limited, Maidenhead, England

Filed Apr. 17, 1979, Ser. No. 30,730

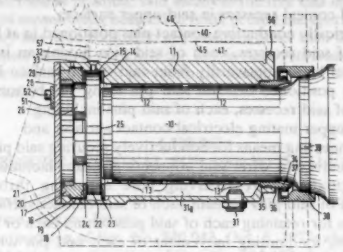
Claims priority, application United Kingdom, Apr. 21, 1978, 15818/78

Int. Cl.³ B61F *15/02*; F16C *17/10*

U.S. Cl. 308—161 **4 Claims**

1. A bearing for an axle, the bearing comprising a housing; a bearing liner to engage the axle in the housing; a radially extending circumferential thrust face on the housing adjacent one end thereof, said face facing in one direction; an internal groove in the housing between said face and said end; a thrust ring located in said groove and having a radially extending circumferential thrust face opposite to, and facing in the opposite direction to, said first mentioned thrust face, said ring

comprising a plurality of arcuate elements assembled into said groove and which are located axially thereby; and a spacer



ring located within said thrust ring to hold the elements thereof in said groove.

4,229,058

CLUTCH RELEASE BEARING ASSEMBLY

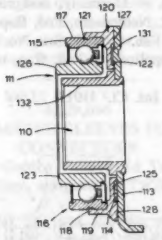
David R. Arrowsmith, Leamington Spa, and David Parsons, Kenilworth, both of England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Oct. 19, 1978, Ser. No. 952,779

Claims priority, application United Kingdom, Oct. 22, 1977, 44027/77

Int. Cl.³ F16D *13/60*; F16C *19/00*

U.S. Cl. 308—184 A **9 Claims**



1. A self-aligning clutch release bearing assembly comprising:

a rolling element bearing having a rotary race and a non-rotary race, said non-rotary race including a part having an axially directed face;

support means on which the bearing is mounted and which permits the non-rotary race to move transversely to the rotary axis of the release bearing assembly so that in use the bearing can align with the rotary axis of the clutch;

and an adhesive viscous material disposed in a space defined between the support means and said axially directed face so as to damp vibration and permit said transverse self-centering movement and being the sole means whereby the rolling element bearing is held in axial assembly to the support means with respective parts of the support means and the axially directed face in direct axial opposition for the transmission of clutch release loads from the support means to the bearing.

4,229,059

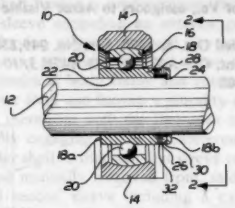
BEARING ASSEMBLY

Alfred J. Dever, 18501 Hilliard, Rocky River, Ohio 44116

Filed Nov. 2, 1978, Ser. No. 957,285

Int. Cl.² F16C *33/30*

U.S. Cl. 308—236 **8 Claims**



1. An assembly for rotatably supporting a shaft, said assembly comprising a plurality of rotatable bearing elements disposed in a circular array, an outer race member circumscribing the circular array of bearing elements, an inner race member circumscribed by the circular array of bearing elements, said inner race member having a cylindrical inner surface adapted to engage the shaft and surface means for defining an annular groove which is disposed between opposite axial end portions of said cylindrical inner surface, said annular groove having a circular bottom surface with a central axis which is offset from the central axis of said cylindrical inner surface, said bottom surface of said groove having a first portion which is spaced apart from said cylindrical inner surface of said inner race member by a first distance to at least partially define a relatively deep part of said groove and a second portion which is spaced apart from said cylindrical inner surface of said inner race member by a second distance which is less than said first distance to at least partially define a relatively shallow part of said groove so that said inner race member has a relatively thin wall portion radially outwardly of said first portion of said bottom surface and a relatively thick wall portion radially outwardly of said second portion of said bottom surface, and retaining means for preventing relative rotation between said shaft and said inner race member, said retaining means comprising a ring member having a cylindrical outer surface and a cylindrical inner surface, said cylindrical outer surface of said ring member having a central axis which is offset from the central axis of said cylindrical inner surface of said ring member so that said ring member has a relatively thick first portion disposed between said cylindrical inner and outer surfaces of said ring member and a relatively thin second portion disposed between said cylindrical inner and outer surfaces of said ring member, said ring member being disposed in said annular groove in said inner race member with said cylindrical outer surface of said ring member disposed in abutting engagement with said bottom surface of said groove, said ring member and said inner race member being rotatable relative to each other between a released condition and a locking condition, said first portion of said ring member being pressed against the shaft by the bottom surface of said annular groove when said ring member and said inner race member are in the locking condition to thereby hold the shaft against rotation relative to said inner race member, said ring member having an axially extending gap in the relatively thick first portion of said ring member, said gap being defined by a pair of spaced apart end surfaces which are disposed diametrically opposite from said relatively thin second portion of said ring member, said retaining means including fastener means for holding said ring member and said inner race member in the locking condition, said fastener means including a fastener member which extends through an opening in the relatively thick wall portion of said inner race member into engagement with said relatively thin second portion of said ring member at a location where the outer surface of said arcuate member is disposed in engagement with the second portion of said bottom surface to tend to maximize

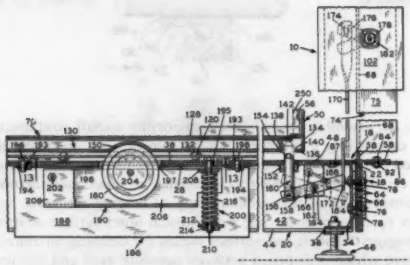
the thickness of the portion of the inner race member through which said fastener member extends.

4,229,060

STOP MECHANISM FOR ROTARY STORAGE CABINET

Sherwood S. Brownlee, Waynesboro, and Warren G. Lohr, Aroda, both of Va., assignors to Acme Visible Records, Inc., Crozet, Va.

Filed Oct. 6, 1978, Ser. No. 949,230
Int. Cl.[2] A47B *88/00*; A47F *3/10*
U.S. Cl. 312—305 **3 Claims**



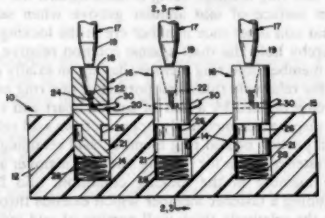
1. In a rotary storage cabinet having a stationary housing with openings in two opposite sides and a rotor mounted for rotation in said housing and wherein said rotor has four sides with two opposite sides positionable to present the contents of the cabinet to the openings in said housing and said rotor also having two other opposite sides positionable to close the openings in said housing, the improvement comprising said housing having a base with an upper surface, said rotor having a rectangular base with an under surface, said rotor base being mounted for rotation relative to said housing base with said under surface facing said upper surface, a plurality of detents in said under surface, a slot through the upper surface of said housing base, a lever pivotally mounted in said base beneath said upper surface, a wheel rotatably mounted on said lever, spring means for urging said lever in one direction, the mounting of said lever and of said wheel on said lever being such that said wheel protrudes through said slot under the urging of said spring means and bears against said under surface, and said wheel seating in a detent whenever a detent aligns with said slot, whereby said rotor is maintained in selected position and restrained against inadvertent movement.

4,229,061

ELECTRICAL ADAPTER OR CONNECTOR

James P. Majors, 19515 Frederick Rd., Germantown, Md. 20676

Filed Apr. 30, 1979, Ser. No. 34,451
Int. Cl.[3] H01R *13/14, 13/24*
U.S. Cl. 339—64 M **1 Claim**



1. An electrical adapter capable of facilitating the installation of new electrical contacts and the repair of defective electrical contacts by insuring the aligned receipt of a plurality of complimentary shaped mating contacts by said adapter, said adapter comprising:

(a) a block of electrically insulating material having an upper surface, said block including a plurality of generally inverted conical recesses in said upper surface;

(b) electrically conductive contact pins positioned in at least two of said recesses, each of said pins having an initial position biased outwardly from said upper surface by a spring positioned beneath said pin along the bottom of each of said recesses, each of said pins including:

(i) an upper mating electrical contact surface; and

(ii) connecting means for conductively securing said pin to a conductive wire, said connecting means including a longitudinal wire receiving bore extending through each of said pins beneath each of said contact surfaces;

(c) means for retaining each of said pins within each of said recesses, for limiting movement of each said pin within each said recess and for continuously maintaining said mating contact surface and said connecting means at a level above said upper surface of said block;

(d) a screw threaded bore extending from said upper mating contact surface to said receiving bore; and

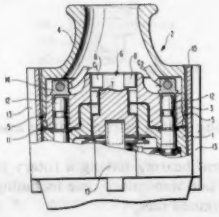
(e) a screw engageable within said threaded bore for securing a wire placed within said receiving bore, said adapter being configured so that when said plurality of complimentary shaped mating contacts is placed into engagement with said upper mating electrical contact surfaces, each of said pins will be downwardly displaced within a corresponding recess until the spring within each recess reacts against said displacement to upwardly bias each said pin towards said initial position, said springs and said complimentary shaped contacts interacting to align the complimentary contacts and mating surfaces and insure an electrical connection therebetween, said bore remaining at all times at a level above said upper surface of said block.

4,229,062

IGNITION LOCK UNIT WITH ANTI-THEFT PROTECTION

Karl Peitsmeier, Neuhausen, and Manfred Link, Waiblingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Neuhausen, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,583
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804614
Int. Cl.[3] H01R *13/44*
U.S. Cl. 339—82 **5 Claims**



1. An ignition lock unit with a disassembly protection that can be rendered inoperable only by means of an associated key rotated into a predetermined position, the ignition lock unit comprising an ignition lock switch part provided with contact pins, a locking rod means extending out of the ignition lock switch part, the locking rod means being rotatable by the key, coupling means connected to cable ends and adapted to be mounted over the contact pins of the ignition lock switch part, characterized in that the coupling means includes a contact carrier plate means having a centrally arranged aperture for accommodating the locking rod means, said locking rod means passing through the aperture when the coupling means are

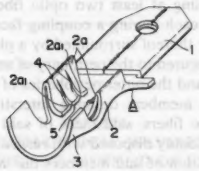
assembled, and in that means are provided at a free end of the locking rod means for preventing a disassembly of the ignition lock unit other than when the key has been rotated into the predetermined position, said means at the free end of the locking rod means being adapted to hook behind the aperture when the key has been rotated to any position other than said predetermined position or when the key is removed from the ignition lock unit thereby preventing a disassembly of the ignition lock unit.

4,229,063

PRESSURE TERMINAL FOR USE WITH ALUMINUM WIRE

Masaaki Yoshizawa, Gotenba, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 840,043, Oct. 6, 1977, abandoned, which is a continuation of Ser. No. 694,172, Jun. 9, 1976, abandoned. This application Dec. 15, 1978, Ser. No. 969,678
Claims priority, application Japan, Jun. 24, 1975, 50-76814
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—95 R **5 Claims**



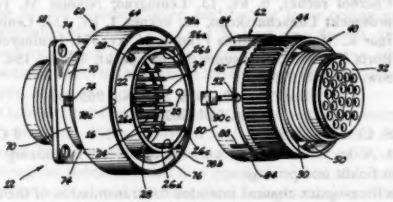
1. A pressure terminal for use with aluminum electric wire formed of a metal having a hardness characteristic greater than aluminum, comprising an electric contact portion and a pressure-connecting portion, wherein at least one inwardly folded contact plate portion is provided inside said pressure-connecting portion and said inwardly folded contact plate portion is provided with at least one incision circumferentially extending from its inside portion, said incision being defined by two side portions, each said side portions forming a ridge having an elasticity in a direction perpendicular to the axial direction thereby adapted to clampingly bite the wire.

4,229,064

POLARIZING ADAPTER SLEEVES FOR ELECTRICAL CONNECTORS

Ottomar H. Vetter, Golden Valley, and Terrance W. Hanlon, Blaine, both of Minn., assignors to TRW Inc., Minneapolis, Minn.

Filed Oct. 25, 1978, Ser. No. 954,615
Int. Cl.² H01R *13/64*
U.S. Cl. 339—186 M **16 Claims**



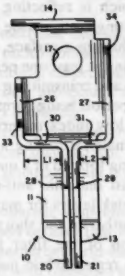
1. In combination with an electrical connector comprising a pair of mateable components, one of said connector components including a cylindrical shell of one diameter, and the other of said components including a shell of smaller diameter than said one diameter shell, and said other connector component further including a coupling ring of larger diameter than said one diameter shell so that said smaller diameter shell will fit within said one diameter shell and said coupling ring will fit over said one diameter shell, said one diameter shell having a circumferential groove extending therearound and said coupling ring also having a circumferential groove extending therearound, a first sleeve encircling an exterior portion of said one diameter shell having a predetermined keyway pattern, and a second sleeve encircling an exterior portion of said coupling ring having a predetermined key pattern complementing the keyway pattern of said first sleeve, said first sleeve including a cylindrical body freely and rotatably encircling said one diameter shell and having a plurality of resilient fingers extending therefrom with the free ends of said resilient fingers releasably engaging in the circumferential groove of said one diameter shell so that said first sleeve can be manually attached to, and manually removed from, said one diameter shell, and said second sleeve including a cylindrical body freely and rotatably encircling said coupling ring and having a plurality of resilient fingers extending therefrom with the free ends of said last-mentioned resilient fingers releasably engaging in the circumferential groove of said coupling ring so that said second sleeve can be manually attached to, and manually removed from, said coupling ring.

4,229,065

ELECTRICAL CONTACT WITH TORSION BARS

Frank C. Jaconette, Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Mar. 5, 1979, Ser. No. 17,130
Int. Cl.³ H01R *13/11*
U.S. Cl. 339—258 T **16 Claims**



1. An improved female electrical contact composed of an electrically conductive material including,

a base portion and at least one upstanding side wall portion extending perpendicularly from an edge of said base portion,

a first elongated contact element joined at one end to said base portion and extending from said base portion to terminate in a free end, said first contact element having a longitudinal axis and a contact surface,

a second elongated contact element having a longitudinal axis substantially parallel to the longitudinal axis of said first contact element, having an inner surface facing and spaced from said contact surface of said first contact element and forming a gap therewith into which a male contact blade can be inserted to make an electrical contact with the female contact, having a significantly greater rigidity in a plane perpendicular to the plane containing said gap than in planes parallel thereto, and having a free end,

a torsion bar spaced from said base portion and having a longitudinal axis, said bar extending laterally from said one side wall portion at substantially a right angle thereto toward the longitudinal axis of said second contact element, and being joined to the end of said second contact

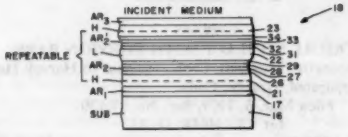
element opposite said free end with the longitudinal axes of said bar and said second element at substantially right angles, said bar, said base, said side wall portion and said first and second elements being of unitary construction whereby the insertion of the male contact blade into the gap tends to twist said bar and produces torsional forces therein which resist the outward displacement of the free end of said second contact element.

4,229,066

VISIBLE TRANSMITTING AND INFRARED REFLECTING FILTER

James D. Rancourt, Santa Rose, and William T. Beauchamp, Windsor, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Sep. 20, 1978, Ser. No. 944,136
Int. Cl.[3] G02B 5/28
U.S. Cl. 350—1.6 14 Claims



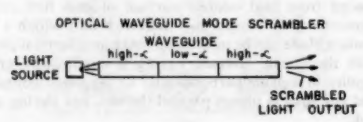
1. In a filter which is reflecting at a longer wavelength region and transmitting over a wide band shorter wavelength region, a substrate having a surface, and a coating carried by the surface comprising at least one period which is reflecting at longer wavelengths and transmitting in a wide band of shorter wavelengths, each period being formed of a plurality of thick layers of high and low index materials with alternate layers being formed of a material having a high index of refraction and other layers being formed of a material having a low index of refraction, at least one thin anti-reflection layer disposed between adjacent thick layers for matching the thick layers of the period to each other in the shorter wavelength region so that the transmission of the filter is relatively high in the shorter wavelength region while maintaining high reflection and low absorption in the longer wavelength region.

4,229,067

OPTICAL WAVEGUIDE MODE SCRAMBLER

Walter F. Love, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 17, 1978, Ser. No. 961,663
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.15 8 Claims



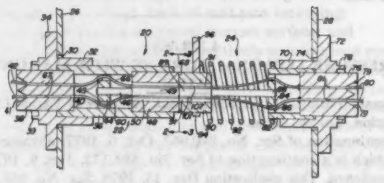
1. An article of manufacture which includes a high-alpha optical waveguide spliced to a low-alpha optical waveguide, the length of the low-alpha optical waveguide being at least sufficient to obtain angular diffusion of light launched therein.

4,229,068

FIBER OPTIC RELAY SWITCH

Malcolm H. Hodge, Claymont, Del., and William M. Dunn, Philadelphia, Pa., assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 1, 1977, Ser. No. 856,440
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.20 12 Claims



1. A fiber optic relay switch for switching optical signals from a first fiber to a second fiber, said switch comprising a first member for housing at least one optic fiber and a second member for housing at least two optic fibers; said first and second members each having a coupling face and including a tube at the center thereof surrounded by a plurality of parallel rods which are secured to the periphery of said tube; each pair of adjacent rods and the outer peripheries of said tubes of said first and second members defining interstitial channels for reception of optic fibers; said faces of said first and second members being slidably disposed with respect to each other so that in a first position of said members the interstital channels thereof are aligned whereby the end of a fiber in said first member and having an end terminated with the coupling face of said first member is aligned with and optically coupled with the end of a fiber which is disposed in said second member and terminated with the coupling face of said second member, and in a second position of said members the end of such fiber in said first member is aligned with and optically coupled with the end of another fiber in said second member which latter end is terminated with the face of said second member whereby movement of said members relative to each other between said first and second positions switches the optical signals in a first path to a second path.

4,229,069

DEVICE FOR REMOTE VIEWING OF OBJECTS IN IONIZING RADIATION FIELDS

Jury D. Motin, ulitsa Sadovaya, 6, kv. 21, Moskovskaya oblast, Podolsky raion, Scherbinka; Igor A. Reformatsky, ulitsa Druzhby 2/19, kv. 85, ow; Pavel R. Sinitsyn, Naberezhnaya Chernoi rechki, 6, kv. 13, Leningrad; Nikolai M. Ivanov, prospeckt Lunacharskogo, 62, korpus 1, kv. 134, Leningrad; Igor K. Malakhov, ulitsa Frunze, 16, kv. 371, Leningrad, and Boris I. Ivanov, Komsomolsky prospeckt, 41, kv. 154, Moscow, all of U.S.S.R.

Filed Nov. 30, 1978, Ser. No. 965,038
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.29 8 Claims

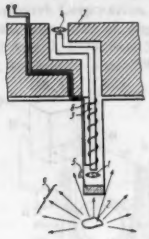
1. A device for remote viewing of objects in ionizing radiation fields, comprising:

a fibre-optics channel intended for transmission of the image of an object under observation beyond a biological shield against ionizing radiation;

an entrance lens of said fibre-optics channel;

a fibre bundle of said fibre-optics channel, one end whereof is placed in the immediate vicinity of said entrance lens, while the other end is beyond said biological shield against ionizing radiation;

a source of heat in said fibre-optics channel, intended to maintain at least only said fibre bundle at a temperature



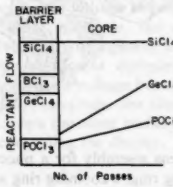
ensuring thremostabilization of its light conducting properties in the presence of the ionizing radiation.

4,229,070

HIGH BANDWIDTH OPTICAL WAVEGUIDE HAVING B_2O_3 FREE CORE AND METHOD OF FABRICATION

Robert Olshansky, Addison, and Arnab Sarkar, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,415
Int. Cl.³ G02B 5/14; C03B 37/075
U.S. Cl. 350—96.31 **13 Claims**



10. A high bandwidth gradient index optical filament comprising

an outer cladding layer,

a barrier layer having an index of refraction equal to or less than said cladding layer disposed on the insdie wall surface of said cladding layer, said barrier layer consisting essentially of a base glass and at least one dopant, the quantity of each of said base glass and dopant being substantially uniform throughout the thickness of said barrier layer, and

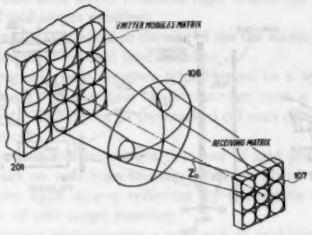
a B_2O_3 free core of high purity glass having a gradient index of refraction disposed within said barrier layer and adhered thereto to form an interface therebetween, said core having an index of refraction equal to or less than said barrier layer at said interface there being no step increase in the index of refraction of the core at said interface, said core consisting essentially of a base glass, and at least one dopant, the quantity of said one or more dopants gradually varying from said interface towards said central axis in a predetermined manner so as to result in a desired substantially continuously varying gradient index of refraction across the cross section of said core.

4,229,071

ELECTRO-OPTICAL SWITCHING APPARATUS

Luigi d'Auria, and Jean-Pierre Huignard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 24, 1978, Ser. No. 889,905
Claims priority, application France, Mar. 25, 1977, 77 09001
Int. Cl.³ G02F 1/03; G02B 27/10
U.S. Cl. 350—150 **9 Claims**



1. Optical switching apparatus for optically coupling at least one photo-emitter circuit of a plurality of such photo-emitter circuits disposed as an emitting matrix to at least one circuit of a plurality of photo-receiver circuits disposed as a receiving matrix, comprising:

a plurality of individually and simultaneously addressable photo-emitter circuits;

a plurality of selecting matrices, one such selecting matrix associated with each photo-emitter circuit, for receiving and selectively transmitting, respectively, light emitted by the photo-emitter circuit associated therewith, each of said selecting matrices including:

a first polarizer for polarizing light received by said matrix,

a layer of electro-optical material for transmitting light polarized by said first polarizer, said layer having first and second faces,

a first plurality of transparent strip electrodes parallel to each other and disposed on said first face,

a second plurality of transparent strip electrodes parallel to each other but crossed with reference to said first plurality of electrodes said second plurality of electrodes being disposed on said second face and defining with said first plurality of electrodes a plurality of crossing points whereat the polarization of light transmitted by said layer can be locally rotated by selective activation of electrodes among said first and second pluralities, and

a second polarizer having a direction of polarization that is crossed with respect to the direction of polarization of said first polarizer for selecting light transmitted by said layer at crossing points whereat the polarization of said transmitted light is rotated;

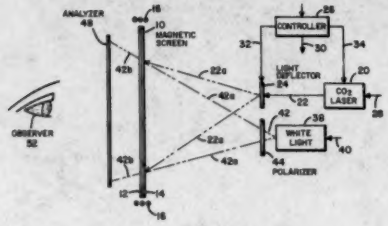
a plurality of photo-receiver circuit matrices, each such matrix associated with a particular one of said photo-emitter circuits and a particular one of said selecting matrices, each such photo-receiver circuit matrix including a plurality of photo-receiver circuits; and

means for forming images of said selecting matrices onto said plurality of photo-receiver circuits, so that light transmitted by each crossing point of one selecting matrix energizes one of said photo-receiving circuits, whereby light from any addressed photo-emitter circuit can be coupled to any photo-receiver circuit within the array of photo-receiver circuits associated therewith by energizing a selected cross point of the selecting matrix associated therewith.

4,229,072
COLOR DISPLAY SYSTEM USING MAGNETO-OPTIC SCREEN HAVING A DISPERSIVE FARADAY COEFFICIENT

Ernest J. Torok, Saint Paul; David L. Fleming, Edina, and Thomas R. Johansen, Minneapolis, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 6, 1978, Ser. No. 913,259
Int. Cl.³ G02F *1/09*; G11C *13/06*; H04N *9/31*; G11B *11/10*
U.S. Cl. 350—151 **3 Claims**



1. A multicolor display system, comprising:

magneto-optic means including magnetic means having a plurality of separate localized areas, each of which localized areas is capable of having a different associated Faraday coefficient for light of each of four different associated wavelengths said magnetic means comprising;

a multilayer magnetic bubble domain memory plane formed of first and second magnetic film layers separated by and affixed to a non-magnetic layer; and

said localized areas of each of said four patterns are formed of no or one or two magnetic bubble domains in none or one or both of said first and second magnetic film layers, respectively;

means for generating a multiwavelength light beam;

polarizer means for polarizing said multiwavelength light beam along a plane polarization axis;

analyzer means having a plane polarization axis that is rotated with respect to the crossed orientation to the plane polarization axis of said polarizer means;

means establishing groups of said localized areas of said magnetic means into four patterns, the localized areas of each of said four patterns having the same Faraday coefficient but the Faraday coefficient of the localized areas of said four patterns being different, with each of said different Faraday coefficients associated with a separate different one of said four different wavelengths; and

display means, including said analyzer means, for simultaneously displaying said four patterns as four different color patterns and simultaneously providing a four color display.

4,229,073
ISO-INDEX COUPLED-WAVE ELECTRO-OPTIC FILTERS

James F. Lotspeich, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

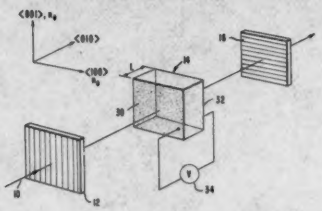
Filed Aug. 10, 1979, Ser. No. 65,704
Int. Cl.³ G02F *1/03*
U.S. Cl. 350—150 **8 Claims**

1. An optical filter comprising:

first and second polarizers spaced from one another along a predetermined path and having their respective pass directions for polarized light oriented at a desired angular relationship with respect to one another;

a crystal of birefringent material in which the birefringence becomes zero and changes sign at a predetermined wavelength disposed along said path between said first and second polarizers and oriented with its optic axis perpendicular to said path;

means for directing light at a plurality of wavelengths including a preselected wavelength in the vicinity of said predetermined wavelength through said first polarizer and said crystal along said path; and

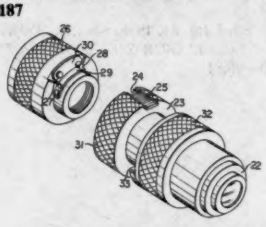


means for applying a dc electric field to said crystal to produce wave coupling therein between ordinary and extraordinary polarizations of light at said preselected wavelength, whereby light at said preselected wavelength is selectively passed or blocked by said second polarizer.

4,229,074
ZOOM LENS ASSEMBLY FOR PHOTOGRAPHIC CAMERAS

Masahiko Nonogaki, Konan, Japan, assignor to Elmo Company Limited, Japan

Division of Ser. No. 782,784, Mar. 30, 1977, Pat. No. 4,162,822.
This application Nov. 16, 1978, Ser. No. 962,565
Claims priority, application Japan, Apr. 9, 1976, 51-45012
Int. Cl.³ G02B *7/10*
U.S. Cl. 350—187 **4 Claims**

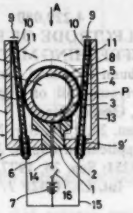


1. In a zoom lens assembly for a photographic camera including a focussing ring, a zooming ring and a stationary fixed tube for supporting said rings and associated lens, the improvement comprising means for making operation of the lens assembly free from the necessity of focussing for certain conditions of the lens assembly, said improvement comprising locking means for fixing said focussing ring at a hyperfocal position on said fixed tube and means cooperating with said locking means for restricting the rotation and hence the zooming range of said zooming ring, whereby a sharp image will be recorded at said hyperfocal position of said focussing ring as set by said locking means, through the restricted zooming range, said focussing ring having an engaging means thereon, said zooming ring being rotatable around the optical axis and being blocked against axial movement and having an engagement means thereon for cooperating with an engaging means for defining the rotation of said zooming ring in said restricted zooming range, and said lens assembly further comprising an intermediate ring between said focussing ring and said zooming ring, said intermediate ring being fixed to said fixed tube and having an engagement means thereon for engagement with said engaging means on said focussing ring for blocking movement of said focussing ring, and having an engaging means thereon for engagement with said engagement means on said zooming ring when said engaging means on said focussing ring is engaged with said engagement means of said intermediate ring.

4,229,075
ELECTROSTATIC DISPLAY DEVICE

Hirotada Ueda, Kobe, and Satoshi Ihara, Akashi, both of Japan, assignors to Displaytek Corporation, Kobe and Daiwa Shinku Corporation, Kakogawa, both of, Japan

Filed Aug. 7, 1978, Ser. No. 931,438
Claims priority, application Japan, Aug. 5, 1977, 52-93896
Int. Cl.³ G02F 1/00
U.S. Cl. 350—269 16 Claims

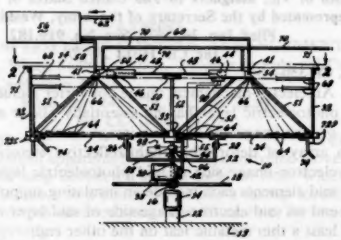


1. An electrostatic display device comprising:
an insulative base;
a substantially transparent fixed electrode mounted on the base, said fixed electrode being constructed of an electrically conductive transparent material, said fixed electrode having inner and outer surfaces;
a substantially transparent dielectric layer applied on said outer surface of said fixed electrode;
at least one resilient sheet electrode fixed at one end thereof to the base and extending therefrom adjacent to the fixed electrode;
a means for applying a voltage between the fixed electrode and the resilient sheet electrode; and
a display placed on or behind said inner surface of the fixed electrode;
whereby when there is no voltage between the fixed electrode and the sheet electrode, the display is visible through the substantially transparent fixed electrode and the substantially transparent dielectric layer thereon, whereas upon applying a voltage between the fixed electrode and the sheet electrode, the sheet electrode is attracted to and covers the outer surface of the fixed electrode, thereby concealing the display.

4,229,076
SOLAR ENERGY CONCENTRATOR

Edsel Chromie, 6720 Belle Glade, San Diego, Calif. 92119

Continuation-in-part of Ser. No. 735,593, Oct. 26, 1976, Pat. No. 4,144,716. This application Jul. 10, 1978, Ser. No. 922,857
Int. Cl.³ G02B 5/08
U.S. Cl. 350—292 12 Claims

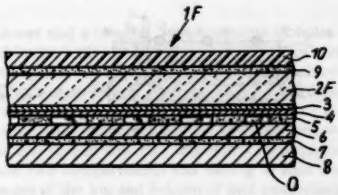


1. Method for producing a light energy concentrator comprising the steps of:
(a) selecting a flat base member of desirable size;
(b) selecting a target member having a flat surface area of desirable size;
(c) selecting a plurality of reflectors of a predetermined size;
(d) positioning said target member above and substantially parallel with said flat surface facing said base member and at a distance from said base member determined by the size of said base member, the size of the flat surface of said target member and the size of said reflectors whereby each of said plurality of reflectors when properly positioned cast their entire reflected light within the flat surface of said target member;
(e) marking an area equal to the size of the flat surface of said target member on said base member;
(f) aligning said base member with respect to a source of light energy so that said target member casts a shadow within the boundaries of the marked off area on said base member;
(g) positioning and securing a first one of said plurality of reflectors on said base member whereby all of the light from the light source reflected by it impacts said flat surface of said target member;
(h) positioning and securing a next one of said plurality of reflectors on said base member so that all of the light reflected therefrom impacts said flat surface of said target member;
(i) covering the reflective surface of said next one of said plurality of reflectors;
(j) repeating steps (h) and (i) above for each of the remaining ones of said plurality of reflectors;
(k) uncovering the covered reflective surfaces; and
(l) removing said target member from its fixed position and discarding same.

4,229,077
GLASS MIRROR PLATE

Kurt Schwab, Innsbruck, Austria, assignor to D. Swarovski & Co., Wattens, Austria

Filed Jun. 7, 1978, Ser. No. 913,504
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726530
Int. Cl.³ G02B 5/10, 7/18
U.S. Cl. 350—293 9 Claims



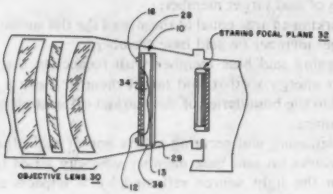
1. A solar collector comprising a curved supporting framework; a pliable mirror plate for mounting on said framework comprising a pliable glass film layer, a reflective layer disposed on one surface of said glass film layer, and a gummed layer disposed on said reflective layer; said pliable mirror plate also including a flexible supporting plate supportably underlying said pliable mirror plate; said pliable mirror plate being mounted on said curved supporting framework.

4,229,078

HYDRO-OPTICAL MODULATOR FOR MODULATING TRANSMISSION OF RADIATION

Vincent T. Bly, Alexandria, and Anthony T. Depersia, Woodbridge, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 28, 1978, Ser. No. 974,157
Int. Cl.[3] G02F 1/11
U.S. Cl. 350—353 19 Claims



1. A hydro-optical modulator for modulating the transmission of a broad spectral range of optical radiation therethrough in an AC sensitive viewing device, said hydro-optical modulator comprising:

a modulator housing having a sealed container enclosed therein comprised of a thin liquid cell that is enclosed by oppositely facing front and back transparent windows wherein said thin liquid cell and said front and back transparent windows are aligned to receive incident radiation therethrough;

a working fluid filling said sealed container; and

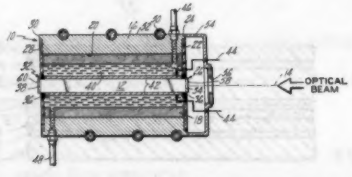
a pressure modulating system in working contact with said working fluid in said sealed container wherein said sealed container is further comprised of a passage between said pressure modulating system and said thin liquid cell wherein said pressure modulating system produces bubbles within said working fluid by expansion of the volume of the working fluid filled sealed container and modulates the size of said bubbles to modulate the transmission of said incident radiation therethrough.

4,229,079

ELECTRO-OPTIC MODULATOR WITH IMPROVED ACOUSTO-OPTIC SUPPRESSION, HEAT TRANSFER AND MECHANICAL SUPPORT

Robert J. Wayne, Glastonbury, and Robert W. Henschke, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 20, 1978, Ser. No. 926,490
Int. Cl.[3] H01S 3/098
U.S. Cl. 350—356 12 Claims



1. An improved electro-optic modulator comprising:

an elongated crystal of material capable of exhibiting an electro-optic effect said crystal having a first and second end at its longitudinal extremities;

a housing longitudinally disposed about the crystal in a spaced apart relationship;

means for supporting the first and second ends of the crystal within the housing wherein said means provides a liquid-tight seal between the crystal and the housing;

an acoustic matching liquid disposed within a cavity enveloping longitudinally the crystal wherein said cavity is defined by the crystal, the housing and the means for supporting the first and second ends of the crystal and wherein said acoustic matching liquid has an acoustic impedance substantially matching the acoustic impedance of the crystal and has high acoustic absorption to the crystal; and

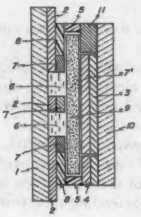
means for applying an electric field across the crystal.

4,229,080

ADDITIONAL ELECTRODE OF ELECTROCHROMIC DISPLAY AND REFRESHING METHOD FOR THE SAME

Hiroshi Take; Katubumi Koyanagi, both of Tenri, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1978, Ser. No. 918,416
Claims priority, application Japan, Jun. 29, 1977, 52-78111; Aug. 18, 1977, 52-99251; Sep. 26, 1977, 52-116211
Int. Cl.[3] G02F 1/17
U.S. Cl. 350—357 13 Claims



1. An electrochromic display cell comprising:

a pair of electrodes, one of said pair functioning as a counter electrode, the other of said pair functioning as a display electrode;

at least one layer of electrochromic material disposed between said counter electrode and said display electrode;

additional electrode means for establishing a unidirectional current path leading from said additional electrode means to the layer of electrochromic material so that the electrochromic layer may retain a low overvoltage, said current path between said additional electrode means and said layer of electrochromic material being independent of a current path extending between said pair of electrodes; and

an electrolyte filled between the electrodes.

4,229,081

ELECTRO-MECHANICAL IMAGE CONVERTER

Terry L. Jones, Springfield, and Brian S. Miller, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1978, Ser. No. 919,182
Int. Cl.[3] H01J 29/70
U.S. Cl. 350—361 1 Claim

1. An electro-mechanical image converter including:

a photoelectric layer having essentially planer and parallel photon-image and electron-image sides;

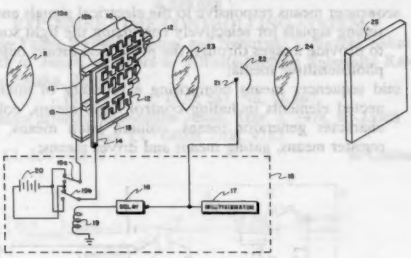
an array of deformable, light-reflective elements on said electron-image side of said photoelectric layer, wherein said elements each include an insulating support with one end on said electron-image side of said layer and with at least a thin metallic leaf on the other end;

means for establishing a voltage potential between said layer and said array and whereby a photon image on the photon-image layer induces an electron image on the photon-image side thereof and further whereby said elements

deflect toward said electron-image side of said layer in accordance with the electron image thereon;

a light source;

means for projecting said light from said light source onto



said elements and for forming an image of light reflected therefrom; and

means for reversing said voltage potential whereby said elements of said array return to their undeflected positions.

4,229,082

SELECTIVE OPTICAL FILTER

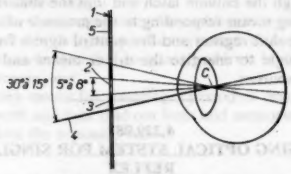
Bernard A. Carreau, 14, Passage Dugueselin, 75015 Paris, France, and Gabriel Lombard, 175, rue de la Pompe, 75016 Paris, France

Filed May 8, 1978, Ser. No. 903,483

Claims priority, application France, May 6, 1977, 77 13840; Feb. 27, 1978, 78 05521

Int. Cl.[2] G02C *7/10*

U.S. Cl. 351—44 **8 Claims**



1. A selective optical filter for use with eyes for the protection and improvement of the vision thereof, said filter comprising, a plurality of different light absorption zones, said zones including a central zone having a low light absorption capability, a second zone surrounding the central zone the second zone being light permeable and having a relatively high light absorption capability, and a third zone extending from at least a portion of the outer periphery of the second zone, the third zone having a low light absorption capability.

4,229,083

TWO SPEED LOOP CONTROL ARRANGEMENT

William R. Wray, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1979, Ser. No. 32,911

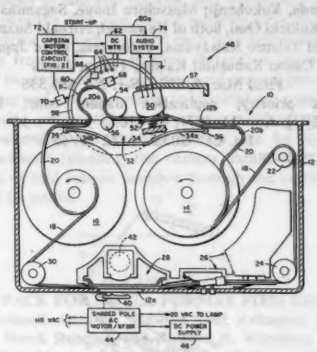
Int. Cl.[2] G03B *19/18*

U.S. Cl. 352—14 **24 Claims**

1. In a control apparatus for providing controlled movement of a flexible strip between a supply location from which the strip is withdrawn at a uniform rate and a takeup location to which the strip is advanced at a nonuniform rate, the improvement comprising:

means for driving the strip at a sufficient speed to at least establish and maintain a buffer loop between the strip supply location and the strip takeup location; and

control means responsive to variations in the size of said buffer loop from a select size for controlling the speed of said drive means to establish and maintain said loop substantially at said selected size, said control means being operable in either a first relatively fast mode of response or a second relatively slow mode of response, said control



means also comprising means for transferring control of the speed of said drive means between said first fast response and said second slow response without substantial immediate change in the average speed of said drive means.

4,229,084

TRANSPARENCY CASSETTE AND VIEWER OR PROJECTOR

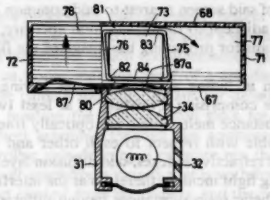
Tadashi Goto, 380, 3-Chome, Tsukagoshi, Kawasaki, Japan

Continuation of Ser. No. 597,638, Jul. 21, 1975, abandoned, which is a continuation of Ser. No. 365,109, May 30, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 645,252

Claims priority, application Japan, Jun. 14, 1972, 47/59142

Int. Cl.[3] G03B *23/02;* G09F *11/30*

U.S. Cl. 353—113 **4 Claims**



1. A viewer and a cassette, which cassette includes planar upper and lower walls and is in the general form of a parallelepiped and which includes two compartments, each compartment having a cross-section corresponding to the dimensions of slides adapted to be received therein and adapted for holding stacks of slides, each compartment having an end wall and a separate box-shaped structure interposed between and connecting the two compartments and having at least one open end, passages at the top and bottom of said connecting structure communicating with both said compartments, the lower wall of said cassette being provided centrally with a first opening of a size corresponding to a slide to be projected, said box-shaped connecting structure also provided with an opening aligned with said lower wall cassette opening, said viewer having a housing provided with a light source, a condenser lens and a focusing lens, a protruding, hollow supporting element provided on said housing and removably entering said open end of said box-shaped connecting structure and support-

ing said cassette, with said openings optically aligned with said condenser lens and said focusing lens.

4,229,085

FILM READER

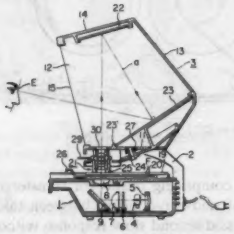
Yu Yamada, Kokubunji; Mutsuhiro Inoue, Sagamihara; Toshio Arai; Kokichi Omi, both of Kawasaki; Hiroaki Suzuki, Hachioji, and Tetsuro Kuwayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1978, Ser. No. 884,536

Claims priority, application Japan, Mar. 10, 1977, 52/28856[U]; Apr. 11, 1977, 52/41092

Int. Cl.³ G03B *21/22, 21/60*

U.S. Cl. 353—75 **9 Claims**



9. A film reader comprising:

a housing having an observation aperture;

means for illuminating a film having an image recorded thereon;

a screen disposed in said housing and in opposition to said observation aperture for allowing an observer to observe from outside said housing an image projected thereon, said screen having a number of concentrically arranged ring strip surfaces having different inclination angles and having increasing diameters away from a common center of said ring strip surfaces, which center is located off said screen, the plane of the surface of said screen being disposed at an inclination relative to the horizontal plane and an end of said screen nearest to said common center being located adjacent to the observation aperture; and

optical means for projecting the image of the film onto said screen;

said screen including a diffusion layer having an internal structure comprising a mixture of at least two synthetic resin substance melts which are optically transparent and non-soluble with respect to each other and which have different refractive indexes, said diffusion layer diffusingly reflecting light incident thereinto at the interface between the synthetic resin substances having different refractive indexes, and said screen further including a rough surface formed on the diffusion layer.

4,229,086

PHOTOSENSITIVE RECORDER PROVIDING LINGUISTIC CHARACTERS

Jack Beery, Fairport, N.Y., and Andrew S. Mihalik, Jr., Northville, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 836,599, Sep. 26, 1977, abandoned. This application Aug. 3, 1979, Ser. No. 63,465

Int. Cl.³ G03B *41/00*; B41B *13/00*

U.S. Cl. 354—5 **9 Claims**

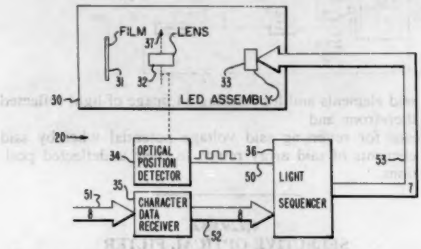
1. Apparatus for converting electrical signals representing visual information into a form which may be made visible in a photosensitive media, the electrical signals being used to operate selected light sources from among an array of light sources to produce light patterns for projection by movable projection means onto the photosensitive media, comprising:

means for receiving and storing electrical signals representing visual information;

position detecting means responsive to motion of said movable projection means to provide timing signals representative of said motion;

sequencer means responsive to the electrical signals and the timing signals for selectively energizing the light sources to provide images through the projection means onto the photosensitive media;

said sequencer means comprising a plurality of interconnected elements including control logic means, column character generator means, column latch means, shift register means, gating means and driver means;



said control logic means responding to the data signals and the timing signals to provide a plurality of control signals;

the column character generator responding to selected control signals and selected data signals to provide column data signals;

the column latch means and shift register means responding to column data signals from the character generator and store-and-shift signals from the control logic to shift data through the column latch and into the shift register;

the gating means responding to the presence of column data in the shift register and fire control signals from the control logic to energize the driver means and the related light sources.

4,229,087

FOCUSING OPTICAL SYSTEM FOR SINGLE-LENS REFLEX

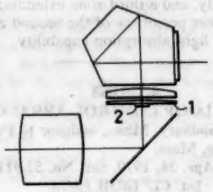
Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,591

Claims priority, application Japan, Feb. 10, 1978, 53-13606

Int. Cl.³ G03B *13/16*

U.S. Cl. 354—23 R **7 Claims**



1. A focusing optical system for single-lens reflex which includes a viewfinder having an optical axis, said optical system comprising a photographing lens, a focusing glass arranged at the position at which an object image is formed by said photographing lens, a penta-prism arranged at the back of said focusing glass, image detecting means, arranged on said optical axis in contact with said penta-prism, for detecting light intensity of paraxial rays for enabling automatic focusing of

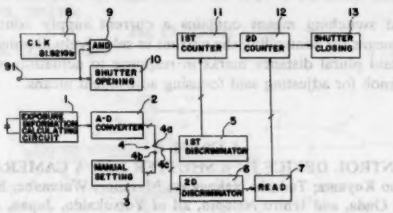
said photographing lens and an auxiliary optical means for transferring a portion of the image of the object image formed on said focusing glass to said image detecting means.

4,229,088

EXPOSURE TIME CONTROLLING SYSTEM

Yoshio Yuasa, Kawachinagano, and Nobuyuki Taniguchi, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1979, Ser. No. 16,607
Claims priority, application Japan, Mar. 1, 1978, 53-23908
Int. Cl.[3] G03B 7/08, 9/62
U.S. Cl. 354—23 D 10 Claims



1. An exposure time controlling system for controlling exposure time by the use of APEX shutter speed value, said exposure time controlling system comprising:

(a) signal producing means for producing a signal corresponding to the APEX shutter speed value;

(b) memorizing means having a plurality of addresses for memorizing a plurality of data corresponding to logarithmically expanded values of various APEX shutter speed values, each of said data being memorized at corresponding one of the plurality of addresses of the memorizing means, respectively;

(c) means for designating one of the addresses in response to the signal of the signal producing means to read out said data memorized at the designated address in said memorizing means; and

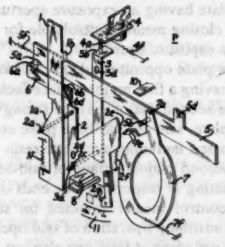
(d) counting means for counting a period of time in accordance with said data read out from said memorizing means to control the exposure time.

4,229,089

AUTOMATIC FOCUSING DEVICE FOR CAMERA

Kiyoshi Kitai; Eiichi Onda; Tomoo Yonemoto, and Shinji Nagaoka, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,725
Claims priority, application Japan, Nov. 18, 1977, 52/138732
Int. Cl.[2] G03B 3/00, 17/38
U.S. Cl. 354—25 5 Claims



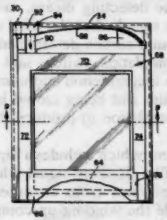
1. In an automatic focusing mechanism, for a double image coincidence type automatic focusing camera, including a release member movable from a first postion through a predetermined stroke to a second position for releasing a camera shutter, and a movable mirror for scanning an object to be photographed in response to actuation of said release member, the improvement comprising: biasing means for biasing said release member toward said first position and for returning said release member to said first position; and mechanical scanning means cooperative with said release member for scanning said movable mirror through one scan each time said release member travels from said first position through a certain initial portion of its stroke before reaching said second position and for returning said movable mirror to an initial pre-scan position as said biasing means returns said release member to said first position, whereby said movable mirror can be repeatedly scanned without releasing the camera shutter by repeated movement of said release member through the certain initial portion of its stroke.

4,229,090

FILM PACK FOR SMALL FORMAT FILM SHEETS

John J. Driscoll, Andover; Nicholas Gold, Arlington; Philip R. Norris, North Reading, and Richard R. Wareham, Marblehead, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1978, Ser. No. 902,063
Int. Cl.[2] G03B 17/02, 17/26, 17/52, 19/06
U.S. Cl. 354—86 13 Claims



1. In a self-processing photographic system including a camera normally intended to operate with a standard film pack of film sheet assemblies which are successively presented at a window in an upper marginal wall of a standard film pack container, the camera including means for defining a well to receive and position the standard film pack for exposure of each film sheet assembly through the container window, a processing roller pair defining a pressure nip through which each film sheet assembly is passed as it is withdrawn from the film pack and ejected, from the camera, and the camera including pick means of limited stroke for engaging each uppermost film sheet and for advancing each film sheet assembly from the film pack to the pressure nip of the processing roller pair, the improvement comprising:

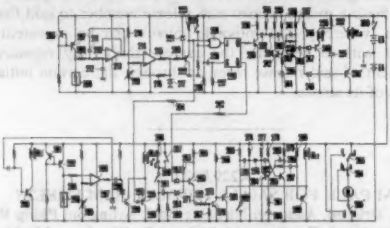
a modified film pack having an exterior surface conformation to fit the camera well in the same manner as the standard film pack and an interior recess to receive one or more superimposed film sheet assemblies of a size smaller than the area of the standard film pack container window and to position said smaller sheet assemblies for exposure in the area of such window; and

a relay pick device carried by said modified film pack for transmitting movement of the camera pick means to advancing movement of each one of the successive uppermost ones of said smaller sheet assemblies in said modified film pack responsive to successive strokes of the camera pick means, said relay pick being constructed so as to automatically return to an initial position prior to its next advancement by the pick means.

4,229,091
MOTOR DRIVE DEVICE FOR A CAMERA

Nobuaki Date, Kawasaki; Susumu Kozuki, Yokohama, and Tomonori Iwashita, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 827,000, Aug. 23, 1977, abandoned. This application Mar. 16, 1979, Ser. No. 21,180
Claims priority, application Japan, Sep. 6, 1976, 51/106463; Sep. 6, 1976, 51/106464
Int. Cl.³ G03B 1/18
U.S. Cl. 354—173 3 Claims



1. A motor drive device of a camera designed so that the motor is automatically stopped at the termination of the film during the continuous photographing, comprising:

a motor for driving a winding up mechanism of the camera for winding up the film and charging the shutter;

an over-torque detecting means, said means producing an over-torque signal when the wind up torque of the camera is larger than a certain determined value;

a wind up completion switch, said switch being changed over by the incompletion and completion of the winding up of the film and being closed in accordance with the wind up completion to produce the wind up completion signal;

a holding means, which includes a flip-flop and is reversed to generate a film finishing signal when an excessive torque signal is generated from an excessive torque detection switch while the winding up completion switch is deactuated; and

a motor control circuit which stops the motor by the excessive torque signal generated by the excessive torque detection means and prevents starting of the motor by the film finishing completion signal input from the holding means, said film finishing signal being connected to at least the motor control circuit.

4,229,092
DISTANCE INDICATOR FOR CAMERA

Hiroshi Iwata, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Continuation of Ser. No. 804,808, Jun. 8, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,174
Claims priority, application Japan, Jun. 17, 1976, 51-71955
Int. Cl.³ G03B 3/00, 17/20
U.S. Cl. 354—198 19 Claims

1. A distance indicator for a photographic camera having a shutter releasing mechanism comprising:

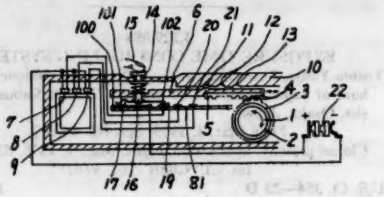
an indication plate provided with plural distance marks representing distances to an object being photographed,

plural light-emitting means for illuminating corresponding ones of said plural distance marks,

a power supply means for supplying electric current to said plural light-emitting means, and

a switching means for selectively feeding current from said power supply means to said light-emitting means,

the switching means being linked with a focusing adjustment means of a main lens and operable independently of said shutter releasing mechanism, wherein said switching means is connected between said power supply means and said light-emitting means for normally stopping current supply from said power supply means to said plural light-emitting means, and

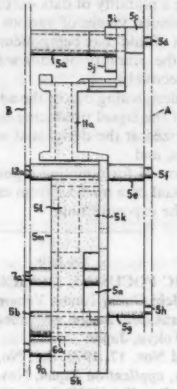


said switching means contains a current supply control means for controlling the current to selectively illuminate said plural distance marks in response to actuation of a knob for adjusting said focusing adjustment means.

4,229,093
CONTROL DEVICE IN A SHUTTER FOR A CAMERA

Mitsuo Koyama; Tadashi Nakagawa; Masanori Watanabe; Eiichi Onda, and Ichiro Nemoto, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,113
Claims priority, application Japan, Dec. 5, 1975, 50-164830[U]
Int. Cl.³ G03B 9/08
U.S. Cl. 354—266 4 Claims



1. A control mechanism for a camera shutter, comprising:

a first base plate having an exposure aperture therethrough;

opening and closing means controllable for opening and for closing the exposure aperture;

a second base plate opposite and spaced from said first base plate and having a first major surface facing said first base plate and a second major surface facing away from said first base plate, said second base plate comprised of synthetic resin and including synthetic resin shafts extending from the second major surface of said second base plate and terminating at respective free ends of said shafts;

mechanical control means mounted on said second base plate for controlling operation of said opening and closing means and including at least one element mounted on one of said shafts of said second base plate; and

a metallic auxiliary base plate spaced from the second major surface of said second base plate fixed to the free ends of said shafts of said second base plate for supporting and

maintaining the relative positions of said shafts and covering said mechanical control means.

4,229,094

CAMERA WITH TRANSVERSELY DISPLACEABLE OBJECTIVE

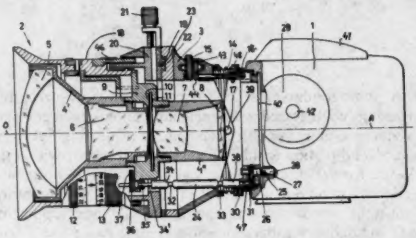
Albert Bäab, and Paul Himmelsbach, both of Bad Kreuznach, Fed. Rep. of Germany, assignors to Jos. Schneider GmbH & Co., Optische Werke Kreuznach, Bad Kreuznach, Fed. Rep. of Germany

Filed Jan. 11, 1979, Ser. No. 2,743

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801994

Int. Cl.[2] G03B *17/56*

U.S. Cl. 354—286 **4 Claims**



1. In a camera comprising a housing with an exposure window and an objective secured to said housing for illuminating a photosensitive medium through said window, said objective being provided with exposure-controlling means and defining an optical axis normally aligned with a reference line passing substantially centrally through said window, adjustable mounting means securing said objective to said housing with freedom of disalignment of said optical axis from said reference line, and release means on said housing for initiating a picture-taking operation,

the combination therewith of a mechanical linkage extending generally parallel to said optical axis from said release means to said exposure-controlling means for actuating same upon operation of said release means, said linkage including a rotatable shaft having a central portion, a first extremity connected with said central portion on the side of said housing, and a second extremity connected with said central portion on the side of said objective, said extremities being independently tiltable relatively to said central portion.

4,229,095

ELECTRO-OPTICAL COLOR IMAGING APPARATUS

Jose M. Mir, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

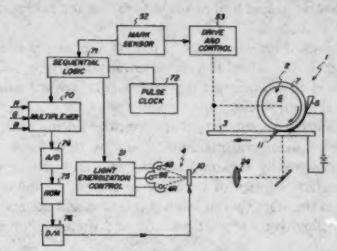
Filed Jan. 29, 1979, Ser. No. 7,283

Int. Cl.[3] G03G *15/01*

U.S. Cl. 355—4 **34 Claims**

14. Apparatus for color imaging, at an exposure station, a photosensitive layer of the kind adapted to record different colors, said apparatus comprising:

(a) exposure means for exposing successive strip portions of such layer at said exposure station, each strip portion comprising a row of pixel regions, said exposure means including a linear array of discretely operable electro-optical means that are each respectively located for alignment with a different pixel region of such strip portions and that are each individually addressable by electrical energization for effecting multicolor exposure of its respective pixel region; and



(b) means for electrically addressing each of said electro-optical means concurrently and according to the color content of respective portions of an image to be produced.

4,229,096

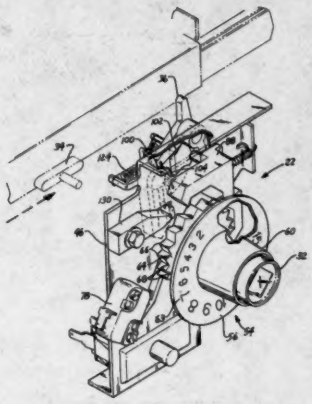
COUNTDOWN AND START MECHANISM FOR AN ELECTROSTATIC COPIER

David P. Bujese, Toms River, N.J., and George P. Rahgo, Stratford, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 26, 1978, Ser. No. 973,214

Int. Cl.[3] G03G *15/00*; G06F *15/18*; G06M *1/00*

U.S. Cl. 355—14 CU **18 Claims**



1. In a controlled, cyclically operable machine having a control circuit, a countdown control mechanism for operating said machine for a selected number of cycles, comprising in combination:

a. a start switch transferable between first and second positions, normally biased toward said second position and electrically connected to the control circuit for (1) continuously operating the machine when said start switch is in said first position and (2) for stopping said machine when said start which is in said second position,

b. means for transferring said start switch from said second position to said first position in order to start the operation of said machine,

c. a releasable latch for maintaining said start switch in said first position to thereby continuously operate said machine,

d. an escape wheel having a plurality of angular settings including a null setting and turnable to any one of said plurality of settings each of which corresponds to a differ-

ent selected number of cycles of operation of said machine,

e. a latch release operable by said escape wheel when said wheel is in said null position for releasing said start switch latch, and

f. an anchor having a pair of pallets alternately operable on said escape wheel for incrementally returning said escape wheel in angular setting increments toward said escape wheel null setting, and

g. means for operating said anchor once during each cycle of operation of said machine, whereby the escape wheel is incrementally returned toward said null setting until the selected number of machine cycles is complete whereupon the start switch latch is released and the start switch transfers to its second position and the machine stops.

4,229,097

APPARATUS FOR THE PHOTOGRAPHIC REPRODUCTION OF TRANSPARENT DOCUMENTS

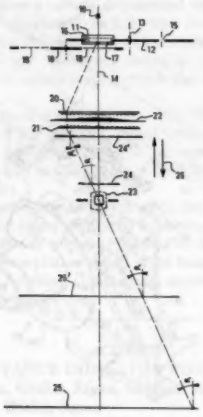
Huguette N. Vulmiere, and Jacques C. Vulmiere, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed May 31, 1978, Ser. No. 911,073

Claims priority, application France, Jun. 3, 1977, 77 16947

Int. Cl.³ G03B 27/72, 27/73

U.S. Cl. 355—35 **14 Claims**



1. Apparatus for the photographic reproduction of transparent documents in black and white or in color, of the type comprising a principal light source, colored or uncolored, a condenser, interchangeable objectives, object and image planes movable with respect to one another and an auxiliary light exposure source, wherein said condenser is constituted by two thin stepped lenses, the source being in the object focal plane of the first of said lenses and the pupil of the objective being in the image focal plane of the second lens, a corrector screen arranged between said two lenses for the variations in illumination in the image plane due to the inclination of the useful beam to the axis of the system, this screen being fixed so that its surface is perpendicular to the parallel ray beam, the constituent elements of the source, of the condenser and of the pupil of the objective used being fixed with respect to one another and movable in a single unit relative to the document to be reproduced according to the focal length of said objective determining the size of the document.

4,229,098

PHOTOGRAPHIC ENLARGER FOR PRODUCING GIANT-SIZE PRINTS

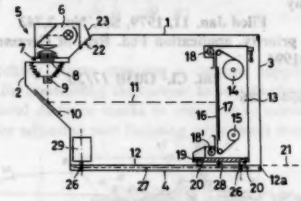
Peter Schmoker, Daenikon-Zurich, Switzerland, assignor to Fotomec S.p.A., Fiume Veneto, Italy

Filed Oct. 26, 1978, Ser. No. 954,916

Claims priority, application Switzerland, Oct. 31, 1977, 13212/77

Int. Cl.² G03B 27/70

U.S. Cl. 355—60 **7 Claims**



1. A photographic enlarger for producing large-size prints comprising: walls forming an enclosure; an enlargement optical system including an objective lens for projecting light rays in a vertical direction within the enclosure; a mirror within the enclosure for deflecting the vertical light rays to a horizontal direction on to a vertical exposure plane within the enclosure; a light-tight box within the enclosure, said box supporting takeup and delivery rollers for photographic paper and a driving mechanism therefor and said box supporting a shutter device for masking the exposure plane and for delimiting the copy size, and said box being arranged so that photographic paper extending between the rollers lies in the vertical exposure plane of the optical system; and mounting means for adjusting the position of the box horizontally toward and away from the mirror.

4,229,099

METHOD AND APPARATUS FOR BURNING OR DODGING PRESELECTED PORTIONS OF AN IMAGE FORMED ON PHOTOGRAPHIC PAPER

Ronald C. Watkins, 263 W. Tulpehocken St., Philadelphia, Pa. 19144

Filed Dec. 22, 1978, Ser. No. 972,608

Int. Cl.³ G03B 27/72, 27/32

U.S. Cl. 355—71 **11 Claims**

1. Apparatus for selectively dodging preselected portions of an image formed on photographic paper by a light source from a developed negative, comprising:

light transmissive support means disposed between said negative and paper for transmitting light to said paper;

at least one cut-out having a lesser surface area than the photographic paper, said cut-out comprising a material which blocks light to which the photographic paper is sensitive to prevent such light from reaching a preselected

portion of said paper and which passes light to which the photographic paper is not sensitive to permit viewing of said paper through said cut-out to align said cut-out with said preselected portion of said paper, said cut-out being disposed on said support means;

whereby said support means transmits light to which said paper is sensitive to expose said paper and said cut-out blocks light to which said paper is sensitive to effect dodging of said preselected portion of said paper.

8. A method of dodging at least a preselected portion of an image formed by a light source on photographic paper from a developed negative, comprising:

placing plural spaced light transmissive elements between said negative and said photographic paper;

placing at least one cut-out of a material which blocks light to which the photographic paper is sensitive and which passes light to which the photographic paper is not sensitive on said light transmissive elements;

aligning said cut-out with the preselected portion of said photographic paper to be dodged; and

exposing said photographic paper to light transmitted through said light transmissive elements while blocking light to which said paper is sensitive from reaching said preselected portion of said paper aligned with said cut-out.

4,229,100

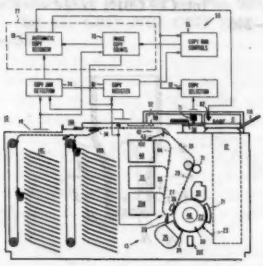
AUTOMATIC COPY RECOVERY

Terence Travis, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,629

Int. Cl.[3] G03G *15/00*; B65H *39/02*

U.S. Cl. 355—77 **11 Claims**



6. The method of operating a copy production machine having collating output means comprising the steps of:

operating said copy production machine so as to process within the machine at the same time copies bearing images from different sources,

maintaining separate counts of copy sheets within said machine bearing images from the same source,

decrementing the nonzero separate count representing the oldest copy sheets in said machine as copy sheets bearing respective ones of said images pass through said collating means, and

actuating said collating output to start a new collating operation when any one of said separate counts is decremented to zero.

4,229,101

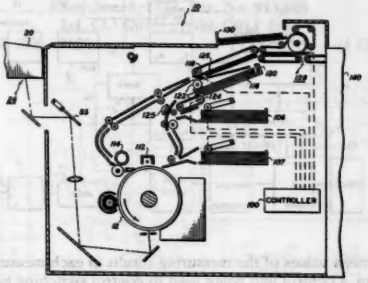
DUPLEX/SIMPLEX PRECOLLATION COPYING SYSTEM

Thomas J. Hamlin, and Clifford L. George, both of Macedon, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 825,743, Aug. 18, 1977. This application Jul. 2, 1979, Ser. No. 54,344

Int. Cl.[3] G03B *27/32*

U.S. Cl. 355—77 **4 Claims**



1. A method of producing pre-collated simplex (one-sided) copy sheet sets at the output of a copier from duplex (two-sided) original document sheets which are recirculated to the imaging station of the copier comprising the steps of:

copying only the first sides of said duplex document sheets in a first copying circulation thereof onto one side of copy sheets as simplex copy sheets,

temporarily storing in said copier said simplex copy sheets made on said first copying circulation of said duplex documents as an intermediate buffer set,

copying the opposite sides of said duplex documents onto additional simplex copy sheets in a second copying circulation and feeding said additional simplex copy sheets as they are made to the copier output alternately and interleaved with copy sheets fed from said buffer set to produce a complete precollated simplex copy sheet set from said duplex document sheets,

and alternately repeating the above first and second copying recirculation steps to form plural, precollated simplex copy sheet sets.

4,229,102

METHOD AND APPARATUS FOR BALANCING OUT DISTURBANCES IN DISTANCE MEASURING SYSTEMS

Klas R. Wiklund, and Lars A. Ericsson, both of Täby, Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed May 19, 1978, Ser. No. 907,577

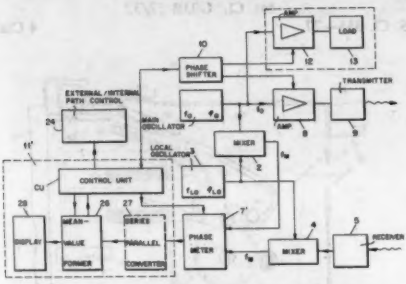
Claims priority, application Sweden, Jun. 3, 1977, 7706290

Int. Cl.[2] G01C *3/08*

U.S. Cl. 356—5 **13 Claims**

1. A method of balancing our interference caused by stray coupling between the internal circuits of a distance-measuring apparatus of the phase-type having a receiver section and a transmitter section, wherein a phase measurement operation is carried out which comprises an external phase measurement wherein a modulated electromagnetic signal is transmitted from the transmitter, reflected by a measurement target and received by a receiver section, and a reference measurement wherein a electromagnetic signal of the same frequency and phase of the first mentioned signal is transmitted from the transmitter section to the receiver section over an internal path of known length for comparison with the signal received by said receiver section during the external phase measurement; wherein at least two groups of separate distance measurements, each comprising at least one said phase measuring operation, are carried out; wherein for each pair of groups the one mea-

suring group is effected with the transmitter unit of the transmitter section supplied with a transmitter signal of a first phase, and the other measurement group is effected with the transmitter unit of the transmitter section supplied with the transmitter signal of a second phase which is displaced substantially 180° relative to the first phase; and the mean value being formed of



the mean values of the measuring results in each measurement group, a control unit being used to control switching between the external phase measurement and the reference measurement during each phase measurement operation and to control switching the phase of the transmitter signal between said first phase and said second phase during alternate measuring groups.

4,229,103

APPARATUS FOR DETERMINING OFF-AIM DURING FIRING SIMULATION

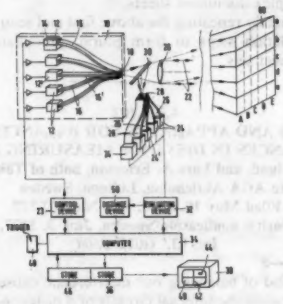
Jan Hipp, SchulteBdamm 57, 2000 Hamburg 64, Fed. Rep. of Germany

Filed Jan. 19, 1979, Ser. No. 5,029

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1978, 2802477

Int. Cl.³ G01B *11/26*

U.S. Cl. 356—141 **15 Claims**



1. A shot simulating apparatus for determining the off-aim distance between the line of sight of a shot-simulator emitting laser light and a target capable of reflecting laser light, comprising:

(a) an optical assembly which has its optical axis parallel to said line of sight and which defines a target field, said assembly including a beam splitter defining first and second image planes of said optical assembly;

(b) a laser transmitter having n opto-electronic laser emitter elements coupled to flat optical conductors, for transmitting laser light into said target field, said conductors having their free ends arranged approximate said first image plane to form a first area divided into n parallel strips corresponding to a first set of n parallel space angle segments projected by said optical assembly on said first image plane;

(c) a laser receiver having n opto-electronic laser detector elements coupled to flat optical conductors, for receiving laser light from said target field, said conductors having their free ends arranged at least near said second image plane to form a second area divided into n parallel strips corresponding to a second set of n parallel space angle segments projected by said optical assembly on said second image plane, said first and second areas of n parallel strips being perpendicular to each other about said optical axis so as to divide said target field into n^2 space angle sectors;

(d) a control means, for controlling said laser emitter elements to emit individually time-coded laser light selectively into the space segments of said first set; and

(e) an off-aim determining means, for evaluating the vertical and lateral off-aim distance of a reflecting target by identifying the space angle sector from which reflected laser light is received through identification of the time code and the receiving detector elements.

4,229,104

MIXING CUVETTE

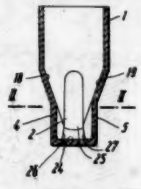
Gerhard Lahme, Quickborn; Dieter Sölter, Hamburg, and Hermann Bohnsack, Halstenbek, all of Fed. Rep. of Germany, assignors to Eppendorf Gerätebau Netheler & Hinz GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,118

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710889

Int. Cl.² G01N *21/24*

U.S. Cl. 356—246 **10 Claims**



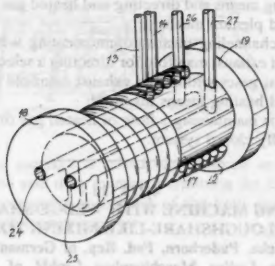
10. A mixing cuvette comprising an upper portion and a lower portion, a longitudinal central axis extending through said upper and lower portions, a pair of opposed wall portions extending generally parallel with said longitudinal axis and defining therebetween a photometric measuring region of said cuvette, with a photometric measuring direction of the cuvette being defined to extend across said measuring region, a pair of side walls each extending between said wall portions on opposite sides of said measuring region, said side walls being configured to define a pair of opposed concave interior surfaces of said measuring region, said concave interior surfaces being shaped to effect an enlargement of the interior of said cuvette through a central region of said measuring portion extending perpendicularly to said measuring direction.

4,229,105

SENSITIVE MEASURING CELL FOR A DIFFERENTIAL REFRACTOMETER OF THE INTERFERENCE TYPE

Sten Silverbage, Bergencrantz väg 6, 196 30 Kungsängen, Sweden

Filed Apr. 12, 1979, Ser. No. 29,401
Claims priority, application Sweden, Apr. 17, 1978, 7804340
Int. Cl.[3] G01N 1/10
U.S. Cl. 356—246 8 Claims



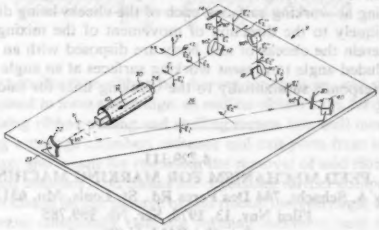
1. A highly sensitive measuring cell for an interference type of differential refractometer, said measuring cell comprising:
(a) a measuring body provided with two channels,
(b) one of said channels being a measuring channel for a medium whose refractive index is to be measured, and
(c) the other measuring channel being a reference channel for a reference medium of a known refractive index, and
(d) means for mechanically adjusting the respective path lengths of said measuring channel and of said reference channel to exactly the same geometrical length for achieving a maximum CMRR value.

4,229,106

ELECTROMAGNETIC WAVE RING RESONATOR

Terry A. Dorschner, Waltham; Irl W. Smith, Jr., Newton, and Hermann Statz, Wayland, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 646,307, Jan. 2, 1976, abandoned. This application May 18, 1978, Ser. No. 907,219
Int. Cl.[2] G01B 9/02; G01P 9/00
U.S. Cl. 356—350 28 Claims



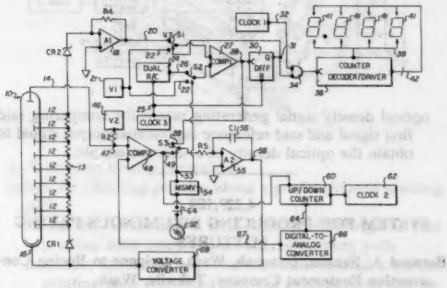
1. In combination:
(a) an electromagnetic wave ring resonator wherein resonant electromagnetic waves propagate through a non-solid medium, such resonator including an amplifier medium;
(b) means, included in such ring resonator, for spatially rotating the electromagnetic field distribution of the resonant electromagnetic waves as such waves pass through the non-solid medium about the direction of propagation of such waves to enable such electromagnetic waves in such resonator to resonate with different frequencies; and
(c) means, including the amplifier medium, for providing different indices of refraction to waves of the same polarization sense passing through such medium in different directions.

4,229,107

OPTICAL DENSITOMETER

Warren Childers, Houston, Tex., assignor to Graphic Arts Manufacturing Company, Houston, Tex.

Filed Jun. 8, 1978, Ser. No. 913,680
Int. Cl.[3] G01N 21/00; G01J 1/42
U.S. Cl. 356—443 14 Claims



1. A method for measuring the optical density of a photographic sample, including steps of
generating a signal envelope defining exponential curves decaying toward a common crossing point;
selecting from within said envelope a reference exponential signal cooperating with the operating characteristics of a preselected photomultiplier tube to obtain a plurality of predetermined outputs when said photomultiplier tube is exposed to a plurality of known reference optical densities;
exposing said photomultiplier tube to an optical density to be measured;
deriving a dynode signal voltage for said photomultiplier tube to maintain an anode current through said photomultiplier tube at a preset reference condition during said exposure to said optical density to be measured; and
deriving an optical density output signal funtionally related to the time for said reference exponential signal to decay from a high level functionally related to said dynode signal voltage to a low level functionally related to a first known reference optical density.

4,229,108

OPTICAL DENSITOMETER

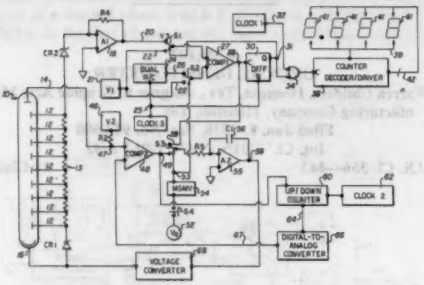
Warren Childers, Houston, Tex., assignor to Graphic Arts Manufacturing Company, Houston, Tex.

Filed Jun. 8, 1978, Ser. No. 913,809
Int. Cl.[3] G01N 21/00; G01J 1/42
U.S. Cl. 356—443 8 Claims

1. An optical densitometer with improved resolution having a photomultiplier tube with a controlled anode current and varying dynode voltage when measuring light intensities, comprising:
anode reference signal generator means maintaining an analog reference anode signal corresponding to an anode current obtained from a reference dynode voltage when said photomultiplier tube is exposed to a reference optical density sample,
dynode voltage adjustment means for maintaining the anode current equivalent to said analog reference anode signal

during a measurement cycle and producing a first output signal,

means for generating a reference exponential output signal,



optical density signal generating means for comparing said first signal and said reference exponential output signal to obtain the optical density of a selected sample.

4,229,109

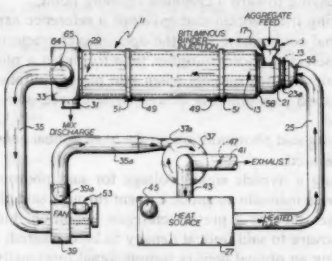
SYSTEM FOR PRODUCING BITUMINOUS PAVING MIXTURES

Bernard A. Benson, Issaquah, Wash., assignor to Boeing Construction Equipment Company, Tukwila, Wash.

Filed Apr. 24, 1978, Ser. No. 899,385

Int. Cl.³ B28C *1/22, 5/46*

U.S. Cl. 366—24 **14 Claims**



1. A partially closed system for producing bituminous paving mixtures comprising:

drum mixer means having an intake region in the vicinity of one end thereof and a discharge region in the vicinity of the other end thereof, said drum mixer means being operable, when fired, to produce a bituminous paving mixture at said discharge region;

means for introducing graded aggregate into said drum mixer means at said intake region;

means for introducing a bituminous binder into said drum mixer means at said intake region;

plenum means disposed at said intake region and arranged to substantially enclose the end of said drum mixer means at said intake region, the interior of said plenum means being open to the interior of said drum mixer means;

exhaust manifold means disposed at said discharge region and arranged to substantially enclose the end of said drum mixer means at said discharge region;

heating means, spaced apart from said drum mixer means, for producing a heated gas having a temperature in the range of 700 to 2000 degrees Fahrenheit;

said heating means comprising a burner, a combustion chamber having an outer periphery within said heating means and a heating means manifold substantially surrounding said combustion chamber;

said burner being arranged to produce an open flame for direction into said combustion chamber for a portion of the length thereof;

sealing means for sealing the ends of said heating means manifold to the outer peripheral surface of said combustion chamber;

said combustion chamber having a plurality of slot-like openings in at least a portion of its peripheral surface for permitting gas from said heating means manifold to pass into said combustion chamber through said openings;

first channeling means for receiving heated gas from said heating means and directing said heated gas to the interior of said plenum means;

second channeling means communicating with the interior of said exhaust manifold for directing a selected portion of exhaust gases within said exhaust manifold to the interior of said heating means manifold;

means for maintaining a flow of heated gas throughout said partially closed system.

4,229,110

MIXING MACHINE WITH WEDGE-SHAPED OR PLOUGHSHARE-LIKE MIXING TOOLS

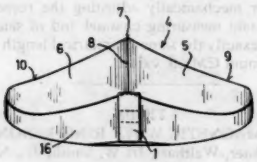
Roland Lücke, Paderborn, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbau GmbH of Elsener Str., Paderborn, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,902

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801460

Int. Cl.³ B01F *7/00*

U.S. Cl. 366—343 **1 Claim**



1. A mixing machine for particulate material, said machine having movable wedge-shaped or ploughshare shaped mixing tool members each of which has a body having a tip running upstream and lateral cheeks which are oppositely disposed relative to the longitudinal center line of said body, said cheeks acting as working surfaces, each of the cheeks being disposed obliquely to the direction of movement of the mixing tools, wherein the cheeks of said body are disposed with an obtuse included angle to present working surfaces at an angle which corresponds substantially to the breaking lines for said material.

4,229,111

FEED MECHANISM FOR MARKING MACHINE

Roy A. Schacht, 744 Des Peres Rd., St. Louis, Mo. 63131

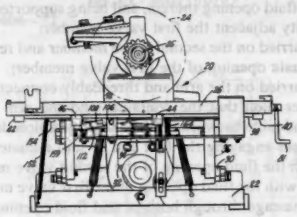
Filed Nov. 13, 1978, Ser. No. 959,785

Int. Cl.³ B41J *11/06*

U.S. Cl. 400—45 **12 Claims**

1. In a marking machine having a vertically moveable carriage supporting a transversely moveable work table supporting a workpiece to be marked by marking characters, said table being transversely moveable with respect to said carriage to advance the workpiece as it is being marked, table advancing means comprising a toothed rack having a series of teeth equidistantly spaced along a side of the rack and pawl means engageable with said rack for advancing the table the distance between adjacent teeth for each marking operation, the improvement comprising said pawl means including a feed pawl having a pair of teeth engageable with the teeth in said rack, said pawl being pivoted at one end to a feed link member

operable to pivot one end of the pawl and pivoted at a second end to a drag member operable to pivot a second end of the feed pawl about a moveable pivot member, limit guide means on said carriage defining upper and lower stops for said pivot



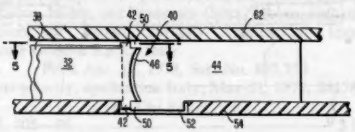
member as the carriage is raised and lowered and friction clutch means on said drag member permitting the drag member to move responsive to contact of the limit guide means with the moveable pivot member.

4,229,112

RANDOM STUFFER RIBBON CARTRIDGE WITH IMPROVED RIBBON EXIT CONTROL

John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,596
Int. Cl.³ B41J *33/10*
U.S. Cl. 400—196.1 **3 Claims**



1. In a stuffer type ribbon box having top, bottom, and side walls joined to form a cartridge, an endless ribbon loop, further comprising ribbon pulling and stuffing means, box wall means defining a storage chamber, entrance and exit ports from said cartridge; and means for regulaing the removal of said ribbon from said chamber; said means for regulating further comprising, slot means for the passage of said ribbon therethrough, said slot means comprising two slot forming members, said slot forming members matingly comprising stop surfaces engageable with each other to regulate the width of said slot means, said stop surfaces supported by said slot forming members wherein said slot forming members support said surfaces and further define upper and lower constraints for the end of said slot means;

resilient means biasing at least one of said members toward the other of said members;

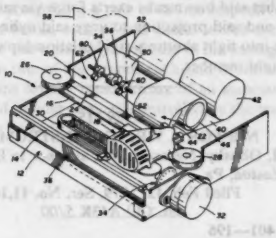
said slot forming members defining a slot means having a shape deviating from a plane sufficient to cause said ribbon to buckle out of a plane, thereby causing the adjacent ribbon folds to be moved away from said slot means thereby preventing jamming.

4,229,113

SHARED DOCUMENT FEED STATION

Theodore H. Anderson, R.R. #1; Wallace E. Beuch, R.R. #2, both of Pine Island, Minn. 55963, and Richard E. Lagergren, R.R. #1, Rochester, Minn. 55901

Filed Oct. 5, 1978, Ser. No. 948,860
Int. Cl.² B41J *13/00*
U.S. Cl. 400—596 **16 Claims**



1. A printing system comprising:

means for effecting printing along a predetermined printing path;

means for advancing a first document through a first printing zone extending across the printing path;

means for advancing a second document through a second printing zone overlying the first printing zone and extending across the printing path;

means for normally activating the first document advancing means and responsive to the presence of a document in the second printing zone for actuating the second document advancing means;

the second printing zone extending laterally beyond the first printing zone; and

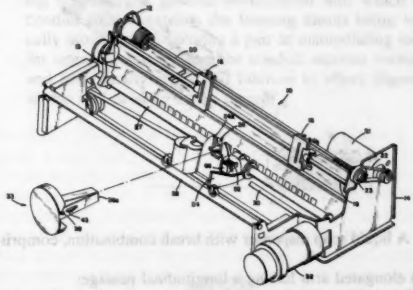
first and second document detecting means located in the portion of the second printing zone extending beyond the first printing zone and on opposite sides of the printing path.

4,229,114

MECHANISM FOR OPERATOR-REPLACEABLE PRINTHEAD

Arthur C. Van Horne, Santa Clara, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Filed Feb. 12, 1979, Ser. No. 11,385
Int. Cl.³ B41J *29/00*
U.S. Cl. 400—692 **15 Claims**



1. A mechansim for mounting a removable print head or like device to the shuttle of a printer, said device including a cylindrical head section and a generally tapering guide section, said mechanism comprising:

a generally upright member on said shuttle, having an opening through which said quide section is insertable,

at lest one wedge-shaped projection extending from said guide section,

a releasable retaining assembly mounted on said shuttle, including at least one movable locking member adapted for clamping, wedging engagement with said guide section projection, and

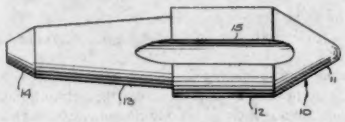
bias spring means for urging said locking member into clamping engagement with said guide section projection, so that said bias means exerts force via said locking member and said projection to urge said cylindrical head section into tight abutting, rigid relationship with said shuttle upright member.

4,229,115

NIB FOR A WRITING INSTRUMENT

Lester H. Olinsky, Nazareth, Pa., assignor to Binney & Smith, Inc., Easton, Pa.

Filed Feb. 12, 1979, Ser. No. 11,147
Int. Cl.[3] A43K *5/00*
U.S. Cl. 401—196 **3 Claims**



1. A molded nib for a writing instrument comprising:

a porous plastic tapered tip portion of substantially circular cross section;

a porous plastic substantially cylindrical barrel portion extending from said tip portion and of the same diameter as the maximum diameter of said tip portion; and

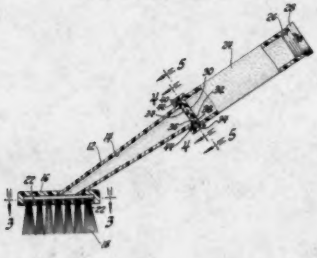
a porous plastic trunk comprising a frusto-conical portion of smaller maximum diameter than said barrel portion and extending from said barrel portion.

4,229,116

LIQUID SOAP DISPENSER AND BRUSH COMBINATION

Lee P. Moore, 13315 S. Norfolk, Detroit, Mich. 48235

Filed Mar. 5, 1979, Ser. No. 17,367
Int. Cl.[3] A46B *11/04*
U.S. Cl. 401—275 **1 Claim**



1. A liquid soap dispenser with brush combination, comprising:

an elongated arm having a longitudinal passage;

a first valve member carried on a first end of said arm so as to be rotatable therewith about an axis of rotation, said first valve member having a fluid opening for receiving liquid soap into said passage, and an arcuate opening disposed about said axis of rotation, said arcuate opening having a first end and a second end;

brush means carried on the opposite end of said arm, said arm having outlet opening means for passing liquid soap from said passage to said brush means;

a container;

a second valve member carried with the container so as to be rotatable therewith, the second valve member having a second fluid opening therein, and being supported in close proximity adjacent the first valve member;

a finger carried on the second valve member and received in the arcuate opening of the first valve member;

a collar carried on the arm and threadably connected to the container such that the container and the arm are relatively movable between a first rotated position defined by said finger engaging the first end of said arcuate opening in which the fluid opening of the second valve member is aligned with the fluid opening of the first valve member to permit passage through both of said fluid openings, and a second rotated position defined by the finger engaging the second end of the arcuate opening in which the fluid opening in the second valve member is blocked by the first valve member; and

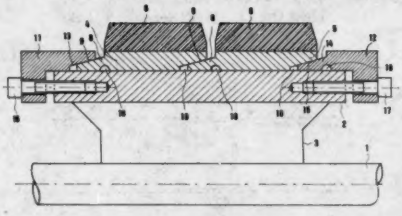
an O-ring sealingly mounted between said valve members and said collar.

4,229,117

APPARATUS FOR SECURING A METAL HOOP ONTO A METAL RIM

Roland Coppin, Marbaix-la-Tour, and Andre Ghislain, Laneffe, both of Belgium, assignors to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed Aug. 29, 1978, Ser. No. 937,768
Claims priority, application Belgium, Aug. 30, 1977, 18351
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—370 **3 Claims**



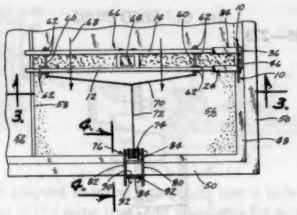
1. An apparatus for securing a plurality of metal hoops to a metal rim, said metal rim adapted for supporting radial loads and having an axial direction, each metal hoop having an internal diameter slighly greater than an external diameter of said rim, each of said metal hoops having two sides with a conical shoulder on one side and a conical bore on the other side, said apparatus comprising conical clamping means for deformably clamping said metal hoops to said rim, said clamping means comprising at least two clamping collars, one of said collars having a conical shoulder and the other one of said collars having a conical bore, said plurality of hoops arranged slidably on said rim with said conical shoulders thereof extending in the same axial direction, said other one of said clamping collars arranged slidably on said rim and over the conical shoulder of one of said plurality of hoops and said one of said collars arranged slidably on said rim and with its conical shoulder extending in the same axial direction as said conical shoulders on said plurality of hoops, said clamping means further including means for connecting said collars to said rim and for drawing said collars axially towards said plurality of metal hoops.

4,229,118

SCREED SUPPORT

Russell L. Kisling, 1220 S. Third St., Beatrice, Nebr. 68301

Filed Jan. 17, 1979, Ser. No. 4,021
Int. Cl.[2] E01C *19/22*
U.S. Cl. 404—72 16 Claims



14. A method of smoothing and finishing a newly poured surface adjacent an upright form having an inwardly extended generally horizontal surface, comprising,

providing a pair of elongated screed members secured in generally parallel spaced-apart relation,

supporting one end of said screed members on an upstanding plate having a flat bottom surface,

arranging said plate in parallel relation to the upright form with the flat bottom surface supported on the horizontal surface,

supporting the other end of said screed members at a height approximately level with said one end,

maintaining said plate in uniformly spaced relation from the form whereby a portion of said poured surface lies between said plate and said form, and

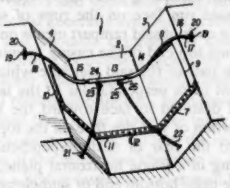
advancing said screed members across said surface and thereby simultaneously sliding said plate along the horizontal surface.

4,229,119

LIFTABLE AND COLLAPSIBLE BARRAGE

Bruno Borca, Milan, and Francesco Calza, Monza, both of Italy, assignors to Pirelli Furlanis—Applicazioni Idrauliche Agricole Gomma S.p.A., Italy

Filed Apr. 17, 1978, Ser. No. 897,750
Claims priority, application Italy, May 31, 1977, 24178 A/77
Int. Cl.[2] E02B *7/20*
U.S. Cl. 405—96 3 Claims



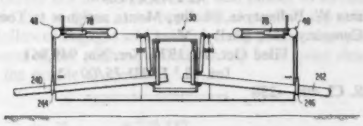
1. A barrage for a waterway which waterway has a bottom and a bank along each side, said barrage separating the waterway into upstream and downstream portions, said barrage being adapted to be raised and lowered and comprising a flexible inextensible sheet having a vertical length not less than the depth of the waterway and spanning the width of the waterway, continuous means for fixing the said sheet along one of its sides to the bottom of the waterway and to the side banks of the waterway in water-tight relations, a rigid tubular element and two flexible tubular elements fastened respectively to the central portion and to the two lateral portions of the side of the sheet opposite to that side of the sheet which is fixed to the bottom and side banks of the waterway, a flexible inextensible cable passing through said tubular elements, the ends of said cable are fixed to the side banks of the waterway downstream of the barrage, at least two flexible inextensible cables each having one extremity fixed to the rigid tubular element and other extremities fixed to opposite side banks of the waterway upstream of the barrage and means to vary the length of the cables fixed to the side banks of the waterway, said means to vary the length comprising a pair of drums respectively fixed on opposite side banks, each of said cables which are fixed to the side banks of the waterway upstream of the barrage having one end fixed to one of the drums, each said drum being provided with means for the rapid release of an associated cable fixed to the rigid tubular element controlled by the water level upstream of the barrage.

4,229,120

SUBMARINE PIPELINE ALIGNMENT RIG

Kenneth W. Wallace, Gretna, and Anthony V. Gaudiano, Metairie, both of La., assignors to Taylor Diving & Salvage Co., Inc., Belle Chasse, La.

Filed Sep. 11, 1978, Ser. No. 941,288
Int. Cl.[3] B63C *11/00*; F16L *1/04*
U.S. Cl. 405—158 30 Claims



1. Apparatus for working on conduit sections in a submerged location, comprising:

truss means having a fulcrum assembly adapted to engage a submerged conduit section a distance from said conduit's end and provide a fulcrum therefor about which said conduit section may pivot; and

working means spaced from said fulcrum assembly for aligning of said conduit section, being detachably connected to the truss means and including housing means for containing a submerged gaseous environment into which said conduit section extends the housing means being vertically movable and carrying a pair of manipulating means for engaging and moving the conduit sections vertically and horizontally about said fulcrum to effect alignment within said housing means thereof.

4,229,121

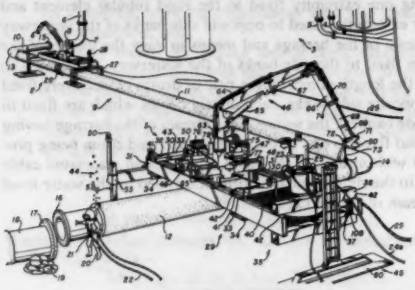
CONCRETE REMOVAL APPARATUS

Lee O. Brown, Houston, Tex., assignor to The Sea Horse Corporation, Houston, Tex.

Filed Nov. 17, 1977, Ser. No. 852,244
Int. Cl.[2] F16L *1/00*
U.S. Cl. 405—158 2 Claims

1. A submarine concrete removal tool comprising a crescent carrying two coaxially opposed concrete removal jets and

track means for said crescent for transporting said jets along pipe wherein said track means comprises a pipe lift means



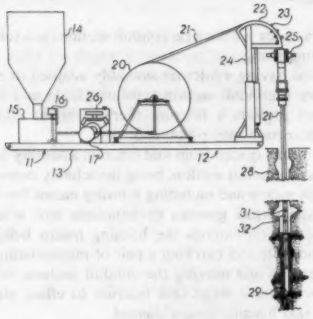
coaxial therewith for lifting and holding pipe above the sea floor.

4,229,122

HOLE FILLING AND SEALING METHOD AND APPARATUS

James W. Ballantyne, Shelby, Mont., assignor to Toole Energy Company, Inc., Shelby, Mont.

Filed Oct. 10, 1978, Ser. No. 949,961
Int. Cl.³ E02D *15/00*
U.S. Cl. 405—258 **7 Claims**



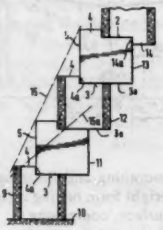
1. A method of continuously filling and sealing a hole extending a great distance into the earth and containing liquid contaminants, the steps comprising forming a cement slurry, continuously pumping said cement slurry through a continuous conduit disposed in a coiled configuration on the surface of the earth with the free end thereof extending the entire distance to the bottom of said hole, continuously forcing said cement slurry from the open end of said conduit while said conduit is being withdrawn from said hole, continuously monitoring the level of said cement slurry within said hole remotely at a point adjacent that at which the withdrawal of said conduit from said hole is controlled, controlling the rate of withdrawal of said conduit so as to maintain the open end thereof below the level of the cement slurry being deposited within said hole, and removing the contaminants from said hole as they are displaced by the cement slurry being deposited therein.

4,229,123

INCLINED RETAINING WALL AND ELEMENT THEREFOR

Erich Heinzmann, Balfrinstrasse 17a, CH-3930 Visp, Switzerland

Filed Jan. 16, 1979, Ser. No. 3,987
Claims priority, application Switzerland, Jan. 18, 1978, 509/78
Int. Cl.³ E02D *29/02*
U.S. Cl. 405—273 **14 Claims**



1. An inclined retaining wall secured to the soil of a slope of an inclined piece of terrain for covering, retaining and securing said slope, said wall being adapted for having plants planted therein and permitting the roots of said plants to grow downward into the soil of said slope, said wall comprising a plurality of horizontal rows of prism-shaped elements, said rows of elements being superimposed one upon the other in a relationship staggered rearwardly in upward direction, said elements of each row being spaced relative to one another leaving gaps therebetween, a concrete or stone base at the foot of said slope on which base a lowermost row of said elements is supported, each element of superimposed one of said rows bridging a corresponding gap in the next adjacent row therebeneath and being aligned in an inclined series with an element in any second row therebeneath or thereabove; each of said prism-shaped elements comprising:

(a) a casing having a hollow soil-fillable interior open at the top end and the bottom end of said element, a front wall zone of said casing being destined to face away from said slope, and said casing further comprising side wall zones adjacent said front wall zone, and a rear wall zone, and

(b) rampart means at least on the face of the rim of said open top end, protruding upwardly above said rim face and being positioned centrally on said front wall zone, said rampart means extending rearwardly from said central position on said rim face on the rims of said side wall zones; the two ends of said rampart means on said rim face about said open top end of the casing forming steps with the remaining part of the said rim face which steps comprise abutment faces perpendicular to the last-mentioned rim face and destined to face toward the slope, all the remaining portion of said rim face on the top open end of said casing to the rear of said perpendicular abutment faces extending in a single horizontal plane, and the rim face about the open bottom end of said element being in a single horizontal plane.

4,229,124

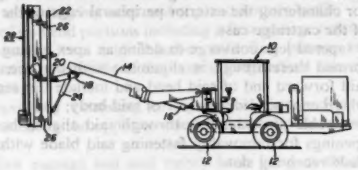
AUTOMATIC ROOF BOLTING SYSTEM FOR MINES

G. Robert Frey; Joseph Parrotto, and Francis X. Fontaine, all of Franklin, Pa., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 15, 1979, Ser. No. 12,429
Int. Cl.² E21D *11/00*
U.S. Cl. 405—303 **9 Claims**

1. Mine roof bolting apparatus comprising support means, an indexing device mounted on said support means for rotation about an axis extending parallel to a roof bolt to be inserted

into a mine roof, drilling apparatus carried on said indexing device and adapted to force a drill up into the mine roof to form a drilled hole for the reception of a roof bolt, resin cartridge insertion apparatus carried on said indexing device and adapted to insert a resin cartridge into a drilled hole in the mine roof, roof bolt insertion apparatus carried on said indexing



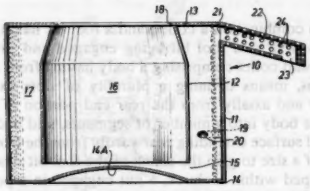
device and adapted to insert a roof bolt into a hole which has been drilled in the mine roof, and apparatus for actuating said indexing device to initially index a drill into alignment with the axis of a hole to be drilled and thereafter index said cartridge insertion device and said roof bolt insertion apparatus into alignment with the drilled hole.

4,229,125

APPARATUS FOR SEPARATING OBJECTS HAVING A TENDENCY TO HITCH TO EACH OTHER

Jan Lindström, Täby, Sweden, assignor to Tekno-Detaljer Sture Carlsson AB, Vallingby, Sweden

Filed Nov. 13, 1978, Ser. No. 960,308
Claims priority, application Sweden, Nov. 14, 1977, 7712840
Int. Cl.³ B65G *51/02*
U.S. Cl. 406—137 **7 Claims**



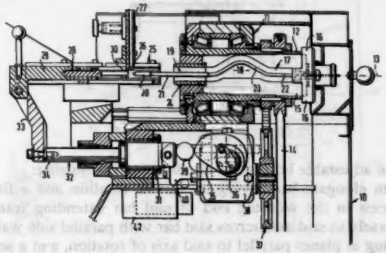
1. An apparatus for separating entangled objects from each other, such as springs or other objects having a tendency to hitch to each other, said apparatus comprising an upstanding receptacle which is generally symmetrical about a substantially vertical axis and contains a separation chamber of annular cross-section formed between a generally cylindrical outer wall and an inner wall located radially inside the outer wall and in coaxial relationship thereto, and means for generating a generally helical flow of air along the inner side of the outer wall in order to move objects, fed into the receptacle, from the lower portion of the separation chamber to a discharge opening located at a higher level, the outer wall being arranged to have a braking or disturbing effect on the objects carried by said air flow when they contact said wall, a reception chamber for objects fed into the receptacle extending radially inside the inner wall from an entrance opening for said objects provided at the upper end of the receptacle and along substantially the entire vertical height of the receptacle to a position near the lower end of the separation chamber, where the reception chamber is connected to the surrounding separation chamber by means of a circumferentially extending opening formed between the lower end of the inner wall and the bottom of the receptacle and adapted to permit objects received in the reception chamber to pass from said chamber to the separation chamber through said opening.

4,229,126

MACHINES FOR TAPPING NUTS

George A. Harrow, Swansea, Wales, assignor to Westlane Industries, Inc., Dearborn Heights, Mich.

Filed Sep. 1, 1978, Ser. No. 938,888
Claims priority, application United Kingdom, May 24, 1977, 21744/77; Aug. 11, 1978, 33142/78
Int. Cl.² B23G *1/18*; B23Q *5/26*
U.S. Cl. 408—63 **4 Claims**



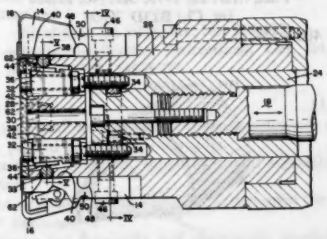
1. A nut tapping machine comprising a rotary tap, a reciprocating pusher in line with said tap, means for feeding a nut to a position between and in line with said tap and pusher, a fluid actuated piston and cylinder unit, said piston having one end connected to said pusher, a rotary cam driven in synchronization with said tap, a cam follower carried by said piston and engaging said cam, said piston acting under fluid pressure supplied thereto in a direction to cause said pusher to advance toward said tap to force a nut onto and along said tap while said cam follower engages said cam whereby to limit the speed of movement of the pusher toward the tap to a speed determined by the profile of the cam.

4,229,127

BORING BAR

Donald L. Bartley, Willoughby, Ohio, assignor to Kennametal Inc., Latrobe, Pa.

Filed Jan. 22, 1979, Ser. No. 5,431
Int. Cl.³ B23B *47/18, 51/00*
U.S. Cl. 408—158 **3 Claims**



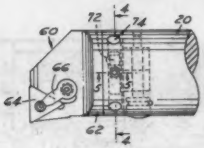
1. A collapsible boring bar which comprises: a drawbar; piston means connected to one end of said drawbar; a head with a first end telescopically engaging said piston means; a spacer telescopically engaged with and abutting a second end of said head; ramp means axially slidable on said spacer and rigidly connected to said piston; at least one radially movable tool unit mounted on the periphery of said head; cylindrically shaped roller means located on said head, said roller means being interposed between said ramp means and said individual tool units and abutting with line contacts said individual ramp means and said individual tool unit so that axial movement of said piston moves said tool units in a radial direction.

4,229,128

REINSERTABLE ADJUSTABLE BORING BAR

Marvin M. Heisner, Howell, Mich., assignor to Fansteel Inc., North Chicago, Ill.

Filed Apr. 30, 1979, Ser. No. 34,446
Int. Cl.³ B23B *51/00*
U.S. Cl. 408—185 **2 Claims**



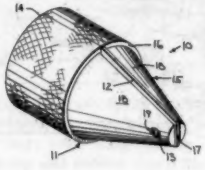
1. An adjustable boring bar combination comprising:
(a) an elongate bar having an axis of rotation and a first recess in the working end of said bar extending transversely to said axis across said bar with parallel side walls lying in planes parallel to said axis of rotation, and a second transverse recess formed as a well in the bottom of said first recess and closed at each end,
(b) an adjustment screw having a threaded shank with each end mounted for rotation in said bar at the respective ends of said second recess and axially retained in said bar,
(c) an index block slidably positioned in said well and having a projection extending into said first recess and having a tapped hole to receive said threaded shank of said adjustment screw,
(d) a boring head having a rib with parallel side walls to fit slidably in said first recess and a hole on said rib to receive said projection on said index block, and
(e) means to retain said rib in said first recess comprising a lock pin in a transverse hole aligned with said first recess and communicating therewith through an opening in a wall of said first recess, and a pressure screw to move said pin laterally against one side of said rib of said boring head.

4,229,129

CHAMFER TOOL

Gordon N. Schaenzer, 11737 N. Solar Avenue 77W, Mequon, Wis. 53092

Filed Mar. 21, 1979, Ser. No. 22,636
Int. Cl.³ B23D *79/08*
U.S. Cl. 408—228 **2 Claims**



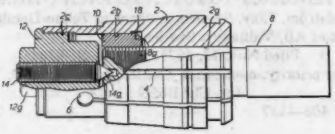
1. A tool for chamfering the peripheral edges of the mouth of an empty cartridge case, comprising:
a hollw body including a cylindrical base, and an integral conical head extending forwardly from the base which is recessed at its lower end from the external surface of said base to provide a circumferential shoulder therebetween, said conical head includes a solid forward end in this form of a frustum of a right circular cone and said head is bisected by a blade-receiving slot extending from said shoulder through its forward end to form a pair of opposed blade-supporting portions,
said forward end includes aligned openings formed therethrough transversely of said blade-receiving slot;
a V-shaped blade disposed in said blade-receiving slot, said blade including a pair of tapered legs which taper at about the same angle as the slope of the conical head, and extend beyond the surfaces of said conical head to present outer cutting edges for chamfering the interior peripheral edge of the mouth of the cartridge case, and inner cutting edges for chamfering the exterior peripheral edge of the mouth of the cartridge case,
said tapered legs converge to define an apex having a bore formed therethrough in alignment with the openings in said forward end of said head and include flat rear ends which engage said shoulder of said body; and
a removable pin extending through said aligned bore and openings for removably fastening said blade within said blade-receiving slot.

4,229,130

COLLETS

Reginald A. Franklin, Witney, England, assignor to Crawford Collets Limited, Oxfordshire, England

Filed Jul. 11, 1978, Ser. No. 923,652
Claims priority, application United Kingdom, Dec. 28, 1977, 53930/77
Int. Cl.³ B23B *31/20;* **B23C** *5/26*
U.S. Cl. 409—234 **6 Claims**



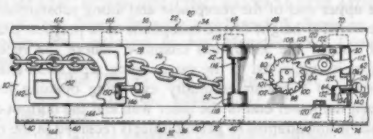
1. In combination a collet, and a tool bit having a threaded end portion, said tool bit being engaged and gripped in the collet, said collet comprising a body having front and rear end portions, means defining a plurality of slots extending forwardly and axially from the rear end portion of the body to split the body into a number of segments, said body having an internal surface extending rearwardly from the front end of the body of a size to grip the shank of the tool bit when the collet is clamped within a chuck, a nut engaged in a portion of the body of the rear of the tool bit-engaging surface such that the nut is restrained, against rotation relative to the body, said nut being insertable into the body from the rear end thereof, and the threaded end portion of the tool bit being threadedly engaged with the nut, a member threadedly mounted on the body at the rear end portion thereof to engage the rear end of the tool bit and to lock the tool bit in the nut, and means defining a radial clearance between said nut and the collet body with said tool bit gripped therein.

4,229,131

TIEDOWN WINCH

Richard E. Hague, Franklin, Mich., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Jan. 21, 1977, Ser. No. 760,870
Int. Cl.³ B60P *3/06, 7/08;* **B61D** *45/00*
U.S. Cl. 410—12 **8 Claims**



1. A vehicle tiedown winch for use in a tiedown system

including a track structure having opposed tracks, at least one of which has spaced latching recesses, said tiedown winch comprising:

a housing;

a central chamber located between a pair of end portions of the housing;

top and bottom walls extending between said end portions;

a winch drum in said chamber mounted for rotation about an axis extending between said top and bottom walls;

a first of said end portions including a first passage extending outwardly from said chamber, said first passage being disposed to one side of the central longitudinal axis of the housing;

a transversely extending cavity in said first end portion disposed on the opposite side of said central longitudinal axis;

said first passage and said cavity both lying in the same horizontal plane;

a locking bolt slidable in said cavity between a retracted position and a locked position wherein said bolt extends transversely from said housing for engaging said latching recesses;

said bolt being substantially shorter than the width of said end wall structure.

4,229,132

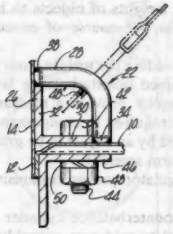
CARGO TIEDOWN ANCHOR MEANS

Chester J. Taylor, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 16, 1978, Ser. No. 961,436

Int. Cl.³ B61D *45/00*

U.S. Cl. 410—115 **5 Claims**



1. In association with a motor vehicle having a cargo box that includes a box front wall, a floor, and a rear tailgate: the improvement comprising a first cargo tiedown anchor means bolted to the floor at the front wall, and a second cargo tiedown anchor means bolted to the floor adjacent to the tailgate; said first anchor means comprising a first rail extending along the box front wall for substantially the full width of the box, said first rail having a first horizontal flange abutting the floor upper surface and a second upstanding flange in near adjacency to the box front wall, and a series of curved rods located at spaced points along the rail, each curved rod having one of its ends welded to the horizontal flange and its other end welded to the upstanding flange; each rod being connected to the respective rail flange at the tip area of the flange whereby the space circumscribed by the rod is sufficient to readily receive the hook connector of a flexible cargo tiedown mechanism; said second cargo tiedown anchor means comprising a second rail extending along the floor for substantially the full width of the cargo box, and a second series of curved rods located at spaced points therealong; the second rail-rod assembly being identical to the aforementioned first rail-rod assembly, whereby the second assembly can be removed from its position on the cargo box floor and stowed atop the first rail-rod assembly; each curved rod having a circular cross section for engagement with cargo-retention hooks or straps adapted to take different angular positions relative to the cargo box floor in accordance with the dimensions of the cargo.

4,229,133

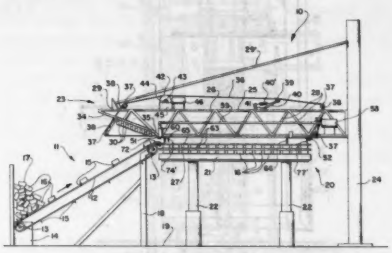
LUMBER SPACER AND STICK LAYER

Charles L. Johnson, 1000 Virgie St., Durham, N.C. 27705

Filed Sep. 20, 1978, Ser. No. 944,073

Int. Cl.³ B65G *57/26*

U.S. Cl. 414—42 **7 Claims**



1. A lumber stick laying and spacing device comprising: means for moving individual pieces of lumber onto a support means for a row of lumber; spacer means for separating each piece of lumber as it is moved onto said row, said spacer means being in the form of a plurality of spacer blocks movably mounted on an inclined track, means responsive to said lumber moving onto said support means for individually releasing said blocks whereby each block in turn will slide down said track into spacing relationship between said lumber, and an endless cable operatively associated with said spacers for reciprocatingly returning such spacers to said track upon completion of a row of lumber; and means responsive to a completed row of spaced lumber for automatically laying at least one stick means on top of the completed row of spaced lumber whereby a stack of lumber can be formed with spacing between each piece of lumber in each row and spacing between rows can be accomplished.

4,229,134

APPARATUS FOR DISPLACING THREE DIMENSIONAL ARTICLES, ESPECIALLY STACKS OF PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 10, 1978, Ser. No. 949,515

Claims priority, application Switzerland, Oct. 24, 1977, 12893/77; Nov. 29, 1977, 14565/77

Int. Cl.³ B65H *31/30*

U.S. Cl. 414—46 **11 Claims**

1. An apparatus for displacing three dimensional articles, especially printed products, comprising:

a substantially horizontal, support element adjustable in its position;

a pusher element exerting a pushing action upon the articles to be displaced;

drive means for forwardly and rearwardly displacing the pusher element parallel to the support element and over said support element;

said pusher element, during its displacement over the support element, bearing upon said support element;

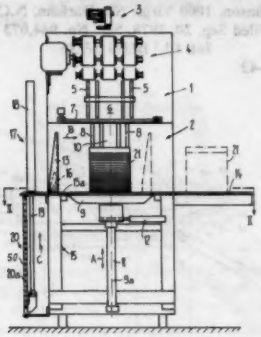
said drive means including a flexible, spatially movable thrust and traction element having a first end and a second end;

said pusher element being secured to said first end of said flexible, spatially movable thrust and traction element;

said drive means further including a drive unit connected with the other end of said flexible, spatially movable thrust and traction element;

guide means through which there is guided said flexible, spatially movable thrust and traction element;

said guide means having a stationary section and at least one section extending within the support element;



said at least one extending section, in a rest position of the support element from which the articles may be displaced, being alignable with the stationary section.

4,229,135

STORAGE SYSTEM INCLUDING MOVABLE PALLET RACKS

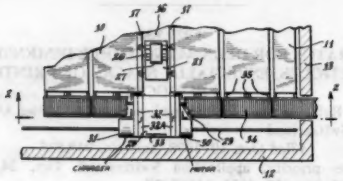
Carl-Henrik B. S. Malmros, Amal, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 21, 1978, Ser. No. 880,011

Claims priority, application Sweden, Feb. 18, 1977, 7701824

Int. Cl.³ B65G 1/06, 1/10

U.S. Cl. 414—284 **3 Claims**



1. In a storage system including a row of separate horizontally movable wheeled rack means arranged to permit a passageway to be formed between selected adjacent rack means, a carriage movable into and along said passageway and having a vertically movable fork lift enabling depositing articles in and removing articles from said rack means, the improvement comprising horizontal rail means affixed to the sides of said rack means, said carriage being positioned to ride on said rail means, a separate horizontal conveying means mounted at the end of each of said rack means, whereby said separate conveying means on each side of said passageway form continuous conveyors parallel to said row of rack means, and further comprising a transfer carriage movable parallel to said row of rack means at said end thereof, said transfer carriage having rail means alignable with the rail means of said rack means, whereby said first-mentioned carriage may be movable into said transfer carriage, said transfer carriage being at a level lower than said conveyor, and further including guiding means for guiding said first mentioned carriage, whereby articles may be moved to and from said fork lift by way of said conveyor.

4,229,136

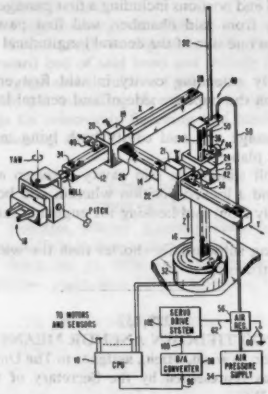
PROGRAMMABLE AIR PRESSURE COUNTERBALANCE SYSTEM FOR A MANIPULATOR

Hugo A. Panissidi, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,647

Int. Cl.³ B66C 1/42

U.S. Cl. 414—673 **17 Claims**



1. A programmable fluid pressure counterbalance system for an X Y Z orthogonal manipulator comprising:

an arm assembly for grasping objects;

storage means for maintaining information representing a measure of the weights of objects to be grasped by said arm assembly in the course of executing an assembly program;

adding means for adding the weight from said storage means to a predetermined counterbalance weight of said arm assembly to thereby provide a measure of the counterbalancing force required to compensate for the effects of gravity produced by an object to be grasped as well as the weight of said arm assembly;

fluid pressure regulator means responsive to said adding means;

a fluid pressure counterbalance cylinder and piston operatively connected to said arm assembly so as to provide forces in opposition to the gravity forces on said arm assembly, said fluid pressure counterbalance cylinder and piston being connected to said fluid pressure regulator to produce the predetermined counterbalancing force which compensates for the gravity forces of both said arm assembly and the grasped object.

4,229,137

PROCESS OF CONVEYING CIGARETTES OR OTHER ROD-LIKE ARTICLES

Desmond W. Molins, London, England, assignor to Molins, Limited, England

Division of Ser. No. 681,247, Apr. 28, 1976, Pat. No. 4,099,637, which is a division of Ser. No. 276,302, May 15, 1975, Pat. No. 3,967,740. This application Mar. 22, 1978, Ser. No. 889,014

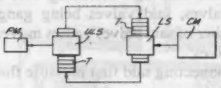
Claims priority, application United Kingdom, Aug. 2, 1971, 36319/71

Int. Cl.³ B65G 65/04

U.S. Cl. 414—786 **11 Claims**

1. A method of conveying cigarettes or other rod-like articles comprising the steps of conveying a stream of rod-like articles towards a loading station in a direction transverse to their lengths, forming the articles into confined batches, moving successive batches into containers at the loading station, moving containers filled with batches of articles away from the

loading station, delivering a succession of containers filled with batches of articles to an unloading station at which the batches of articles are pushed successively out of the containers and are received by retaining means, and conveying from the unloading station, as a continuous stream, the articles received by the retaining means.



4,229,138

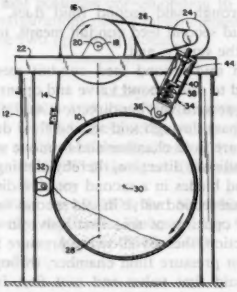
CABLE TENSION ROLLER

George P. Hurst, 235 Hill St., Jackson, Calif. 95642

Continuation-in-part of Ser. No. 763,188, Jan. 27, 1977, Pat. No. 4,078,298. This application Dec. 19, 1977, Ser. No. 861,604

Int. Cl.[3] B65G *47/74*

U.S. Cl. 414—787 10 Claims



1. The combination with a horizontally extending hollow cylindrical drum for bearing material therein for processing, comprising:

a plurality of sheaves spaced over said drum and spaced from each other along an axis parallel with the central axis of said drum for rotation;

means connected to said sheaves for supporting and rotating said sheaves;

a connecting cable means extending around below said drum and around over said sheaves for rotating said drum upon rotation of said sheaves;

means mounted laterally of and abutting to said drum for carrying a laterally directed load; and

means mounted to abut to said drum at a position on said exterior above and substantially opposing the center of mass of material along the interior side wall within said drum when said drum is rotating for selectively loading said drum, wherein said selective loading means comprises an idler arm overlying said drum; roller means for riding said drum; and bias means coupling said idler arm and said roller means for pressing said roller means against said drum to increase traction between said drum and said cable.

4,229,139

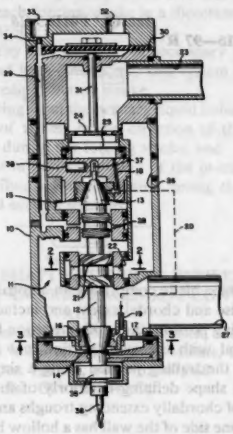
WATER POWERED HIGH SPEED MOTOR

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif. 90503

Filed May 3, 1979, Ser. No. 35,723

Int. Cl.[3] F03B *13/04*

U.S. Cl. 415—29 2 Claims



1. A water powered high speed motor, including, in combination;

(a) a casing defining an inner chamber;

(b) a rotor shaft in said chamber having oppositely directed conical end surfaces;

(c) first and second axially aligned oppositely directed conical bearing blocks engaging in mating relationship said end surfaces to mount said rotor shaft in said casing, said first bearing block being fixed to said casing and said second bearing block being resiliently mounted to said casing for axial movement towards and away from said first bearing block;

(d) means biasing said second bearing block in an axial direction to increase the engaging pressure between said bearing blocks and conical end surfaces;

(e) water inlet means passing into each bearing block to communicate with the surfaces of the bearing blocks and conical surfaces of the shaft;

(f) turbine wheel means on said shaft between said first and second bearing blocks;

(g) turbine wheel water inlet nozzle means communicating with said turbine wheel means;

(h) a high water pressure inlet passage in said casing for directing water under high pressure into said water inlet means in each bearing block so that the conical end surfaces of said shaft float on a film of water covering the engaging surfaces of said bearing blocks to provide a water bearing, said high water pressure inlet passage also connecting to said turbine wheel water inlet nozzle to pass water under high pressure through said turbine wheel means to rotate said shaft, water from between the engaging surfaces of said bearing blocks and conical end portions and from the turbine wheel means passing into said chamber; and

(i) a water outlet passage from said chamber to the exterior of said casing to exhaust water from said chamber, whereby high pressure water simultaneously serves to float said rotor shaft in its bearings and rotate said shaft at high speed.

4,229,140
TURBINE BLADE

Alexander Scott, Bristol, England, assignor to Rolls-Royce (1971) Ltd., London, England

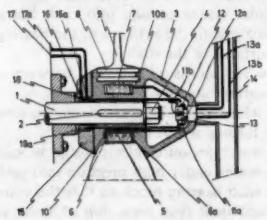
Continuation of Ser. No. 694,031, Jun. 16, 1976, abandoned, which is a continuation of Ser. No. 413,189, Nov. 14, 1973, abandoned. This application Dec. 15, 1978, Ser. No. 973,601
Claims priority, application United Kingdom, Nov. 28, 1972, 54985/72
Int. Cl.³ F01D 5/18
U.S. Cl. 416—97 R **3 Claims**

1. A turbine blade comprising an aerofoil-shaped body having spanwise and chordal extent and including a main portion and a trailing portion, the trailing portion having an upstream end integral with the main portion and a free downstream extremity, the trailing portion being a single wall having an undulating shape defining exteriorly of the wall and at each side thereof chordally extending troughs and ribs, wherein any one rib at one side of the wall has a hollow back defined by one of said troughs at the other side of the wall, and wherein the troughs are open to said downstream extremity and terminate at said upstream end, and cooling air holes extending between the interior of the main portion and the troughs at at least one side of the wall.

4,229,141
DEVICES FOR OPERATING VARIABLE-PITCH PROPELLERS

Jose Luis de Francisco Mesado, Po Cordelles, 6 F, 40 3a, Barcelona (Sardanyola Spain)

Filed Apr. 10, 1978, Ser. No. 895,106
Claims priority, application Spain, Apr. 6, 1977, 458,039
Int. Cl.² B63H 1/06
U.S. Cl. 416—157 R **1 Claim**



1. A variable pitch propeller comprising:
a rotatable propeller shaft;
a propeller hub positioned around and fixed to said propeller shaft and adapted to rotate therewith;
a plurality of propeller blades spaced around said hub, each said blade having a base mounted within said hub for rotation about the axis of said base, whereby rotation of said bases around said axes will vary the pitch of said blades;
an annular cylindrical piston slidably mounted within said hub for rectilinear movement in opposite directions parallel to and coaxial with said propeller shaft;
first and second pressure fluid chambers within said hub at opposite ends of said piston;
a plurality of lugs and extending outwardly from said piston, each said lug engaging a respective said base eccentrically of said axis thereof, whereby rectilinear movement of said piston is transformed into rotation of said bases about said axes;
a double-acting valve unit positioned within said hub for rotation therewith, said unit including first and second double-acting valves, said valves being ganged so that movement of either of said valves causes movement of the other of said valves;
a first fluid duct connecting said first pressure fluid chamber to said first valve;
a second fluid duct connecting said second pressure fluid chamber to said second valve;
first feed conduit means for supplying pressure fluid from a supply to said first valve, and for thereby opening said first valve in a first valving direction;
second feed conduit means for supplying pressure fluid from the supply to said second valve, and for thereby opening said second valve in a second valving direction;
whereby when said first feed conduit means supplies pressure fluid to said first valve and opens said first valve in said first valving direction, said pressure fluid is caused to pass through said first fluid duct into said first pressure fluid chamber and to move said piston in a first rectilinear direction, thereby causing rotation of said bases and blades in a first rotative direction, said opening of said first valve in said first valving direction causing opening of said second valve in said first valving direction, thereby allowing pressure fluid to pass from said second pressure fluid chamber, through said second fluid duct, said second valve and said second feed conduit means, to thereby be returned to the supply; and
whereby when said second feed conduit means supplies pressure fluid to said second valve and opens said second valve in said second valving direction, said pressure fluid is caused to pass through said second fluid duct into said second pressure fluid chamber and to move said piston in a second rectilinear direction, thereby causing rotation of said bases and blades in a second rotative direction, said opening of said second valve in said second valving direction causing opening of said first valve in said second valving direction, thereby allowing pressure fluid to pass from said first pressure fluid chamber, through said first fluid duct, said first valve and said first feed conduit means, to thereby be returned to the supply.

4,229,142
ONE-PIECE PUMPING DEVICE WITH AMBIVALENT OPERATION

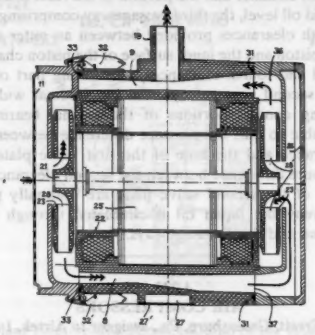
Jean-Claude Le Dall, Rueil-Malmaison, and Jean-Claude M. Pasquet, Saint Cloud, both of France, assignors to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Nov. 6, 1978, Ser. No. 957,918
Claims priority, application France, Nov. 10, 1977, 77 33889
Int. Cl.³ F04B 23/04, 49/02
U.S. Cl. 417—38 **9 Claims**

1. A pumping device having two modes of operation and including at least two centrifugal pump elements connected to a single device motor characterized by:
a one-piece structure for said pumping device, said one-piece structure including means for providing serial or parallel coupling configurations for said centrifugal pump elements; and
means for changing from one of said coupling configurations to the other;
wherein said one-piece structure comprises:
a central member including said drive motor;
a first end member fixedly mounted to and communicating with said central member and including a first continuous

recess for receiving a first one of said at least two centrifugal pump elements;

a second end member detachably mounted to and communicating with said central member and including a second continuous recess for receiving a second one of said at least two centrifugal pump elements, said drive motor including a drive shaft with said at least two centrifugal pump elements being co-axially mounted to opposite ends



of said shaft, said central member and said first and second end members being co-axially positioned with respect to said drive shaft, said configuration changing means comprising:

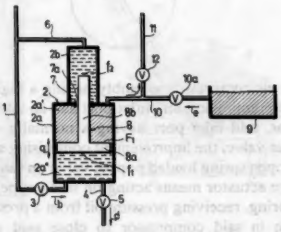
means for releasably securing said second end member to said central member in either of two different positions, each of said positions corresponding to one of the coupling configurations of the pump elements and hence to one of the two operating modes.

4,229,143

METHOD OF AND APPARATUS FOR TRANSPORTING FLUID SUBSTANCES

Janos Pucher, and Antal Schmider, both of Budapest, Hungary, assignors to "NIKEX" Nehezipari Külkereskedelmi Vállalat, Budapest V, Hungary

Filed Apr. 9, 1975, Ser. No. 566,410
Claims priority, application Hungary, Apr. 9, 1974, PU 191
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—53 **4 Claims**



1. A method of delivering a secondary fluid substance from its source by means of the potential energy of a primary liquid column by applying alternative suction and forcing strokes to said secondary fluid substance by means of an exchange of energy between said primary liquid column and said secondary fluid substance, comprising the steps of

interposing an axially aligned system of vessels sealed off from the atmosphere between said primary liquid column and said secondary fluid substance;

sucking into said system of vessels a quantum of said secondary fluid substance from its source during each suction stroke by means of the potential energy of said primary liquid column;

ejecting from said system of vessels simultaneously the quantum of primary liquid which had been introduced into said system of vessels during the preceding forcing stroke;

forwarding said ejected quantum of primary liquid to a situs free from the pressure exerted by said primary liquid column;

drawing in a quantum of primary liquid into said system of vessels during each forcing stroke in a direction opposite to the suction stroke;

and ejecting thereby said quantum of secondary fluid substance which had been sucked into said system of vessels during the preceding suction stroke;

a pressure originating from the primary liquid column acting in said system of vessels in the direction of the suction stroke and also during the forcing stroke; and

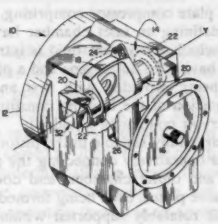
preventing at least in part the mixing of the primary liquid and secondary fluid substance quanta during the alternative forcing and suction strokes.

4,229,144

FEEDBACK SHAFT EXTENDING BETWEEN SWASHPLATE AND DISPLACEMENT CONTROL VALVE

John J. Kass, Dubuque, and Donald O. Johannsen, Sherrill, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 7, 1978, Ser. No. 967,368
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—222 **10 Claims**



1. In an axial piston pump or motor and controls therefor including a pump or motor housing containing a swashplate mounted for angular adjustment, about a fixed axis, between a neutral position for effecting zero fluid displacement, and various positions at varying angular distances from the neutral position for effecting increasing fluid displacement as the angular distance from its neutral position increases, at least one hydraulic actuator coupled to the swashplate for selectively adjusting the latter in response to receiving control fluid pressure, a source of fluid pressure, a fluid sump, a pilot-operated displacement control valve located exteriorly of the housing and having separate fluid ports respectively coupled to the source of fluid pressure, the sump and the hydraulic actuator and including an axially shiftable spool member located within an axially shiftable sleeve member with the spool and sleeve members normally occupying a centered position relative to each other wherein they cooperate to block the flow of fluid to and from the actuator, a valve controller connected to the spool member for shifting the latter axially relative to the sleeve member a distance corresponding to an input command signal received by the valve controller and a feedback linkage connected between the swashplate and the sleeve member for shifting the latter axially to restore the centered relationship between it and the valve spool member in response to the swashplate moving to a new position corresponding to the input command signal, the improvement residing in the feedback linkage and comprising: a feedback shaft located along said fixed axis and having a first end fixed to the swashplate so

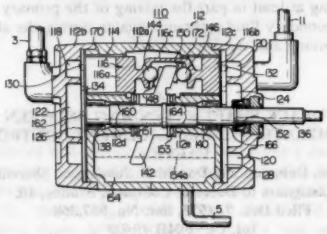
that the shaft rocks about the axis with the swashplate during adjustment of the latter, said feedback shaft extending through the housing and having a second end projecting into the control valve in crosswise relationship to the sleeve member and being connected directly to the latter at a location spaced radially from the axis whereby the sleeve member will be reciprocated when the shaft rocks.

4,229,145

SWASH PLATE COMPRESSOR

Yutaka Isizuka, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 606,276, Aug. 20, 1975, abandoned.
This application Jan. 27, 1977, Ser. No. 763,178
Int. Cl.³ F04B 1/14
U.S. Cl. 417—269 **3 Claims**



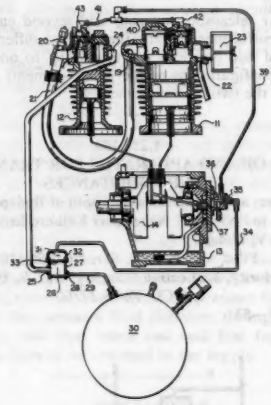
1. A swash plate compressor comprising, in combination:
a housing defining an inlet chamber having an inlet pipe through which refrigerant fluid is introduced, an outlet chamber having an outlet pipe and a piston chamber, the housing being provided with first and second hubs, a bottom portion of the housing constituting a lubricating fluid reservoir containing liquid oil;
a piston reciprocally slidable in the piston chamber;
valve means operatively connecting the piston chamber to the inlet and outlet chambers and comprising first and second valve plates, each being formed with a hole;
a drive shaft rotatably supported within the housing, the drive shaft extending through the hubs of the housing and the hole of the second valve plate, the diameter of the hole of the second valve plate being larger than the diameter of the drive shaft;
a swash plate fixed for rotation with the drive shaft and being operatively connected to the piston to reciprocate the piston in the piston chamber, the swash plate being arranged to partially extend below a lubricating liquid oil level in the reservoir to thereby splash the oil within the housing and atomize the oil in a portion of the reservoir above the liquid oil level;
first and second thrust bearings disposed between the swash plate and the first and second hubs respectively, the first and second valve plates being disposed between the inlet chamber and the first and second thrust bearings respectively;
first and second journal bearings supported by the first and second hubs respectively within the housing to rotatably support the drive shaft, said journal bearings having a sliding contact portion extending over a longitudinal portion of the journal bearing to slidingly support said drive shaft with a clearance being provided between said sliding contact portion and said drive shaft;
first and second passageways connecting the portion of the reservoir above the liquid oil level with the inlet chamber, the first passageway extending through the portion of the reservoir above the liquid oil level, the first thrust bearing, a first clearance defined between the drive shaft and the hub, the clearance between the drive shaft and the sliding contact portion of the first journal bearing, the hole of the first valve plate and the inlet chamber, the second passageway extending through the portion of the reservoir above the liquid oil level, the second thrust bearing, a second clearance defined between the drive shaft and the second hub, the clearance between the drive shaft and the sliding contact portion of the second journal bearing, the hole in the second valve plate and the inlet chamber, and
a third passageway providing communication between the piston chamber and the portion of the reservoir above the liquid oil level, the third passageway comprising third and fourth clearances provided between an outer surface of the piston and the inner surface of the piston chamber, the third and fourth clearances constituting part of the first and second passageways, the longitudinal width of the sliding contact portions of the journal bearings being variable so that the pressure difference between the first clearance and the hole of the first valve plate and the pressure difference between the second clearance and the hole of the second valve plate are optimally provided, whereby the liquid oil is circulated through the first, second and third passageways.

4,229,146

AIR COMPRESSORS

Paul W. Errett, Greensburg, Pa., assignor to Airtek, Inc., North Huntingdon, Pa.

Filed Feb. 2, 1979, Ser. No. 8,472
Int. Cl.³ F04B 49/00
U.S. Cl. 417—281 **8 Claims**



1. In an air compressor assembly having a high pressure air receiver, a compressor, an outlet port and an inlet port on said compressor, said inlet port having a normally closed spring loaded inlet valve, the improvement comprising a two position normally open spring loaded poppet valve on said compressor, oil pressure actuator means acting on said poppet valve opposite said spring, receiving pressure oil from a pressure lubricating system in said compressor to close said poppet valve against the spring in normal operation of the compressor, a pulsation damper having upper and lower chambers connected by a metering means between the compressor and air receiver, a connection from the compressor to the lower chamber delivering high pressure air thereto, a connection from the lower chamber to the air receiver, a connection from the upper chamber to the poppet valve on the same side as the spring, a pressure responsive actuator means selectively acting on the inlet valve, and a connection from the poppet valve to said pressure responsive actuator means acting to deliver pressurized air from the poppet valve to open the inlet valve when the poppet valve is in its open position.

4,229,147

ROTARY POSITIVE-DISPLACEMENT PUMP

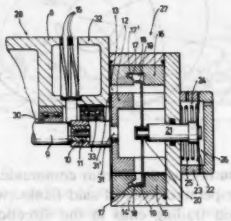
Ernst Linder, Mühlacker; Helmut Rembold, Stuttgart; Walter Teegen, Waiblingen; Achill Kessler, Sindelfingen, and Roland Ehmann, Abstatt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,232

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807721

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—283 12 Claims



1. A rotary positive-displacement pump of the type generating a vacuum comprising, in combination, a housing having a bore and including an inlet side and an outlet side, a rotatable piston eccentrically disposed within said housing bore for rolling engagement therewith, at least one vane in said housing for separating said inlet side from said outlet side and means responsive to supply pressure for locking said vane in a position which shuts off the pumping action of said pump, said locking means including a detent for locking said vane in said position for shutting off the pumping action.

4,229,148

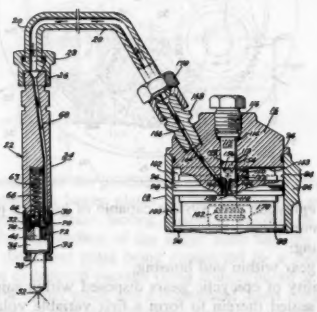
FUEL INJECTION PUMP

James A. Richmond, Monson, and Christopher A. Parent, Holyoke, both of Mass., assignors to Ambac Industries, Incorporated, Springfield, Mass.

Filed Dec. 22, 1978, Ser. No. 972,516

Int. Cl.³ F02M *41/12*

U.S. Cl. 417—485 8 Claims



1. A fuel injection pump comprising a hydraulic head having a bore therein, a fuel pumping plunger slidably disposed in said bore and defining a fuel pumping chamber therewithin in conjunction with a closed end of said bore, means for reciprocating said plunger within said bore to produce pumping and suction strokes of said plunger, fuel supply means for supplying fuel to said pumping chamber during the suction strokes of said plunger, a valveless fuel distribution passage communicating with said bore, passage means in said plunger for delivering high pressure fuel from said pumping chamber to said fuel distribution passage during pumping strokes of said plunger, a spill chamber in said hydraulic head adjacent said plunger, passage means in said plunger connecting said pumping chamber with said spill chamber upon termination of fuel injection, a low pressure fuel chamber, and restricted passage means connecting said spill chamber with said low pressure fuel chamber for producing a pressure buildup in said spill chamber and a restricted drainage of said fuel distribution passage upon injection termination.

4,229,149

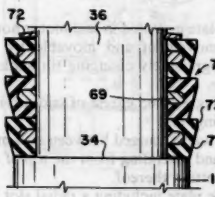
OIL WELL PUMP

Richard L. Turner, Rte. 2, Box 138, Broken Arrow, Okla. 74012

Filed Aug. 28, 1978, Ser. No. 937,156

Int. Cl.³ F04B *21/04, 39/10*

U.S. Cl. 417—554 2 Claims

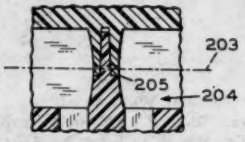


1. A subsurface well pump for disposition within a working barrel of a well bore and arranged for reciprocal movement therebetween, said pump comprising housing means having one end in communication with a well fluid reservoir, ball check valve means carried by the housing means for providing alternate open and closed positions for the pump during operation thereof, self-centering ball stop means disposed within the housing means for cooperation with the ball check valve means for efficient operation thereof in an open position of the pump for admission of the well fluid to the interior of and longitudinally through the housing, discharge means provided in the housing for discharging well fluid from the interior of the housing to an annulus between the housing means and the working barrel for elevation of the well fluid to the surface of the well during operation of the pump, sealing means removably secured to the outer periphery of the housing means and in sealing engagement with the outer periphery of the housing means and the inner periphery of the working barrel for sealing the annulus from the well fluid reservoir, said sealing means comprising a plurality of substantially identical sealing rings having rigid core members removably disposed in stacked relation around the outer periphery of the housing means, each of said core members having a resilient material bonded to the outer periphery thereof for sealing engagement between the adjacent sealing ring and the outer periphery of the housing means and the inner periphery of the working barrel, and means removably engageable with the outermost sealing ring for securely locking the sealing rings in position around the housing means, and wherein the last mentioned means comprises an annular ring of substantially conical cross-sectional configuration wherein the inner diameter of the ring in the normal relaxed position thereof is slightly greater than the outer diameter of the housing means and in a flattened position of the ring the inner diameter thereof is slightly less than the outer diameter of the housing means whereby the inner periphery of the ring bites into the outer periphery of the housing means for securely locking the sealing rings in the sealing position around the housing means.

4,229,150
ANTI-ROTATION ARRANGEMENT FOR NUTATING FLUID DEVICE

Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363

Filed Jun. 2, 1978, Ser. No. 911,803
Int. Cl.[3] F01C *1/00*; F03C *2/00*
U.S. Cl. 418—50 6 Claims



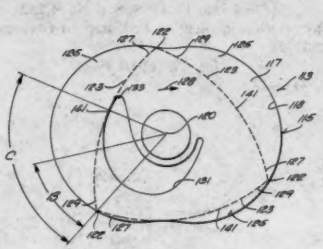
1. In a fluid driven, nutating action appliance
(a) a motor housing consisting of two or more component parts
(b) a wobble plate mounted in said motor housing for universal tilting movement and movable by a driving fluid through progressively changing tilt angles for a nutating action cycle,
(c) means for ingress and egress of said driving fluid into the motor housing, and
(d) a dividing wall arranged between said means for ingress and egress and extending from the top of the motor housing to the bottom thereof,
(e) said wobble plate including a radial slot for reception of said dividing wall,
(f) at least a portion of the edges of the slot being in a close bearing relation to said dividing wall, and the improvement comprising
(g) said dividing wall comprising integral extensions of at least two of said motor housing components arranged in a mating relation
(h) the dividing wall being arranged and configured whereby the areas thereof in a close bearing relation to the radial slot are contoured to a concaved surface,
(i) whereby the close bearing relation between the radial slot and the dividing wall is maintained for the entire nutating action cycle of the appliance, thereby providing a smooth operation for the appliance,
(j) said mating extensions defining a line of intersection therebetween,
(k) said line of intersection being formed whereby at least certain portions of said line of intersection are offest from the radial slot of said wobble plate at any particular angular orientation of the wobble plate.

4,229,151
SIDE PORT - RC ENGINE

Russell J. Van Rens, Waukesha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 12, 1975, Ser. No. 586,266
Int. Cl.[3] F01C *1/02, 21/12*
U.S. Cl. 418—61 A 1 Claim

1. A rotary internal combustion engine comprising a generally trochoid shaped housing including a pair of spaced generally parallel side walls, a generally triangularly shaped rotor supported within said housing for rotation about an axis perpendicular to said side walls, said rotor including three generally identically shaped side flanks which define, in cooperation with said housing, respective chambers which rotate with said flanks and which vary in volume in accordance with such rotation, each of said flanks having an end which leads in relation to the direction of rotor rotation, and end which trails in relation to the direction of rotor rotation and a length extending between said leading and trailing ends, and a charge inlet port which is located in one of said side walls, which selectively communicates with said chambers in response to rotor rotation whereby to open and close said port, which extends arcuately relative to said rotor axis, and which includes a portion which, after opening of said part, terminally communicates with said chambers and which is located such

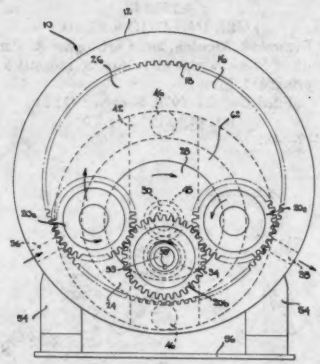


that said portion is closed off from communication with said chambers by respective parts of said flanks, which parts are spaced from said trailing ends in the direction toward said leading ends at a distance of from about 35 to 70 percent of said flank length.

4,229,152
EPICYCLIC GEAR SYSTEM AND DRIVING MEANS THEREFOR

Charles K. Wojcik, Box #42, University of Petroleum & Minerals, Dhahran, Saudi Arabia

Filed Jan. 30, 1978, Ser. No. 873,179
Int. Cl.[3] F01C *1/08*; F16H *3/44*
U.S. Cl. 418—61 R 6 Claims



1. An epicyclic gear system capable of use as a pump or a motor comprising:
a housing;
a ring gear within said housing;
a plurality of epicyclic gears disposed within said housing and sealed therein to form a first variable volume compartment and a second variable volume compartment within said housing; and
drive means attached to at least one of said epicyclic gears, said drive means including means for displacing said at least one epicyclic gear and means for imparting rotary motion to said at least one epicyclic gear about its own axis, said latter means including rotating means and second gear means, the latter comprising a sungear and a planetary gear in engagement with one another, said sungear being fixed with respect to said housing, said planetary gear rolling on said sungear in response to rotation of

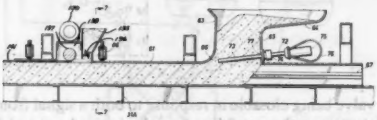
said rotating means and being connected to said at least one epicyclic gear, the latter being in engagement with at least two of said epicyclic gears.

4,229,153

APPARATUS FOR USE IN SLIP FORMING STRUCTURAL CONCRETE MEMBERS

Henry D. Hight, Jr., 6400 Drury La., Fort Worth, Tex. 76116

Filed Mar. 8, 1979, Ser. No. 18,787
Int. Cl.³ B29D 7/12
U.S. Cl. 425—64 **24 Claims**



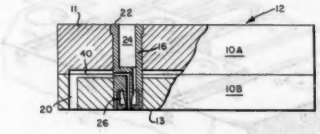
1. Apparatus for use in slip forming a structural concrete member on the top surface of an elongate pallet which has rails extending along its sides, said apparatus comprising a frame having rollers engageable with the rails to support the frame on the pallet for movement forwardly along the pallet, a forming body on the frame having a forming chamber comprising a topwall spaced above the pallet, side walls depending from the top wall to dispose their lower edges close to the top surface of the pallet, and an open rear end through which concrete may pass as the frame is so moved, and a hopper through which concrete may be fed to the front end of the forming chamber, and means for adjusting the elevation of the rollers with respect to the frame so as to raise and lower the lower edges of the side walls of the chamber.

4,229,154

SPINNERET FOR THE PRODUCTION OF HOLLOW FILAMENTS

Castulo Chaban, Jr., Chattanooga, Tenn., and Curtis O. Hawkins, Cove City, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1979, Ser. No. 27,027
Int. Cl.³ B29C 25/00
U.S. Cl. 425—72 S **2 Claims**



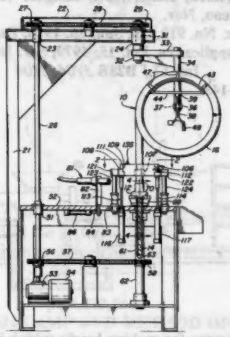
1. A spinneret for the production of hollow filaments comprising: upper and lower plates having contiguous surfaces, said contiguous surfaces having matching cavities to form a chamber, the top surface of the upper plate and the bottom surface of the lower plate being connected by a cylindrical passage, the cylindrical passage being counterbored at the top surface of the upper plate; and a cylindrical insert coextensive with said passage, said insert having a flange at one end that fits into the counterbore in the top surface of the upper plate, said top surface being swaged into said one end, said insert having a first axial bore partially through it from said one end and a second bore coaxial with said first bore partially through it from the other end of the insert, said first and second bores being separated by a median member having a plurality of radially spaced holes in communication with said first and second bores thereby providing a flow path through the spinneret within the insert; an inflation member projecting from a central location on said median member into said second axial bore, said inflation member having an axial passageway in communication with a passageway through said median member which in turn is connected with a source of gas.

4,229,155

APPARATUS FOR BONDING A PLASTIC CASE TO A STUB CABLE

John S Gellatly, La Grange, and Fred T. Richter, La Grange Park, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 72,393
Int. Cl.³ B29C 27/10
U.S. Cl. 425—114 **6 Claims**



2. An apparatus for bonding a straight section of a plastic sheathed, stub cable to a plastic casing part having an aperture formed therein, the cable also having an offset coiled section, which comprises:

a nest for receiving the plastic part;

means for supporting the coiled section of the cable in offset relation to the longitudinal axis of the straight section while the straight section is positioned within the aperture of the casing part;

means for rotating said supporting means about the center of the apertured nest to orbit the coiled section about the longitudinal axis of the straight section of cable;

means for simultaneously rotating the nest to rotate the casing part in unison with the rotating straight section of cable;

means for laying a bead of bonding means along the juncture between the apertured casing part and the straight section of the cable; and

means mounted coaxially of the straight section of the cable for movement toward the nest to force the extruded bead into the juncture between the apertured casing and the straight section of the cable.

6. An apparatus for bonding a flanged cap having a central aperture to the end of a plastic sheath of a cable having a projecting desheathed section and a coiled section, which comprises:

a frame having a table with a slot extending from one edge thereof;

a tube rotatably mounted to the table about the inner end of said table slot and said tube having a longitudinal slot alignable with said table slot for entry of the desheathed section of the cable;

a boom projecting from said frame to overlie the table;

an arm rotatably mounted at one end to said boom;

means mounted on said arm for supporting the coiled section of the cable with the desheathed section extending into said tube;

a nest secured to the tube for supporting the flanged cap with the central aperture about the sheath at the juncture of sheathed and desheathed sections of the cable;

means for simultaneously rotating the arm to orbit the coiled

section of cable about the nest and tube and for rotating the nest and tube; and

an extruder slidably mounted on said table for movement toward and away from said nest, said extruder having a nozzle that is positioned adjacent to the juncture of the flange aperture and the end of the sheath on the cable for extruding bonding material to said juncture of the rotating flange and cable sheath.

4,229,156

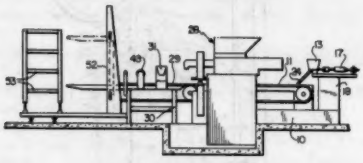
APPARATUS FOR MAKING CONCRETE BRICK HAVING ANTIQUE APPEARANCE

Niilo M. Hyytinen, Reno, Nev., assignor to ABC Concrete Products, Reno, Nev.

Division of Ser. No. 919,529, Jun. 26, 1978, Pat. No. 4,178,340. This application Jan. 15, 1979, Ser. No. 3,577

Int. Cl.³ B28B *3/04, 5/04*

U.S. Cl. 425—145 **5 Claims**



1. In an apparatus for making bricks which includes a molding means having a mold and supply of liquefied hardenable material, the improvement comprising inlet and outlet conveyor means associated with said molding means, at least one pallet carried by said conveyor means, a first hopper located adjacent to said inlet conveyor means and containing a first supply of flowable coloring material, first dispensing means for selectively discharging coloring material from said first hopper onto said pallet as said inlet conveyor means moves said pallet past said first hopper, said brick making apparatus including a mold and means to position said mold in engagement with said pallet to mold at least one brick on said pallet with one side of said brick engaging said coloring material and means to remove said mold from said pallet, a second hopper located adjacent to said outlet conveyor means and containing a second supply of flowable coloring material, second dispensing means for selectively discharging coloring material from said second hopper onto the opposite side of said brick carried by said pallet, and means for saturating said second coloring material on said brick, whereby coloring material is applied substantially to opposite sides only of said brick.

4,229,157

SYSTEM FOR CONTROLLING FEED OF WASTE GAS TO GROUND FLARE

Takusen Ito; Masami Murakami, both of Osaka; Eizo Ishikawa, and Keiichi Otsuka, both of Ibaraki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Sep. 15, 1978, Ser. No. 942,769

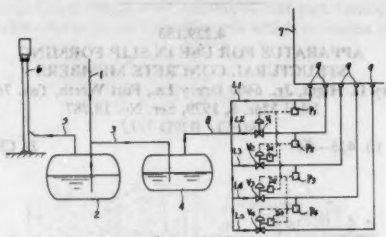
Claims priority, application Japan, Oct. 4, 1977, 52-119850

Int. Cl.³ F23D *13/20*

U.S. Cl. 431—90 **7 Claims**

1. In a system for controlling the feed of waste gas to a ground flare comprising a plurality of branch pipes branching from a waste gas conduit and each connected to burners of the ground flare, a valve mounted on each of the branch pipes other than the first branch pipe for opening and closing the branch pipe, and a pressure detector mounted on each of the branch pipes other than the last branch pipe to feed an opening or closing signal to the valve on the following branch pipe, the improvement comprising:

means mounted on each of the valves for detecting the closing of the valve, and



the valve being closable in response to both a signal from the detector on the preceding branch pipe and a signal from the valve closing detecting means on the following branch pipe.

4,229,158

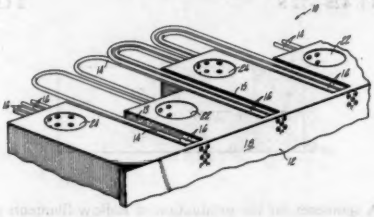
LINEAR CAPILLARY ORIFICE INJECTOR

Joe F. Arnold, North Palm Beach; Robert G. Browning, Lake Park, both of Fla., and Richard A. Meinzer, Newington, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 26, 1979, Ser. No. 15,502

Int. Cl.³ F23C *5/08*

U.S. Cl. 431—178 **8 Claims**



1. An injector for a combustion chamber for injecting fuel and oxidizer into said combustion chamber where combustion ensues, said injector comprising a block-like element having wall means defining a face in said combustion chamber, a plurality of spaced vertically stacked capillary tubes disposed in a slot in said block-like element, which slot extends rearwardly from a point short of the face of said wall means, said capillary tubes terminating in said face and defining an array of orifices disposed in a given pattern which pattern includes two columns of parallel spaced orifices for injecting an oxidizer and a single column of orifices spaced equidistance from two adjacent parallel orifices for injecting fuel, said capillary tubes being sized so that frictional pressure drop regulates the flow therethrough, and separate fuel and oxidizer manifold means in said block-like element for communicating with an end remote from said orifices of each of said capillary tubes.

4,229,159

COMBUSTION DEVICE FOR LIQUID FUELS

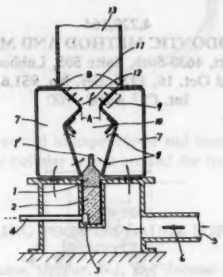
Yoshimi Ohmukai, Hirakata; Takeshi Tomisawa, Katana, and Yoshitaka Kawasaki, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1978, Ser. No. 969,555

Claims priority, application Japan, Dec. 20, 1977, 52/154015; Feb. 27, 1978, 53/1022643; Mar. 10, 1978, 53/028152; Mar. 16, 1978, 53/030684

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—328 11 Claims



1. A combustion device for a liquid fuel comprising a burner head capable of containing the liquid fuel in a liquid state, means for feeding the liquid fuel to the burner head, a fuel vaporizing portion for vaporizing the fuel fed to the burner head, a combustion chamber for burning the fuel released from the vaporizing portion upon vaporizing, means for supplying air to the vaporizing portion and to the combustion chamber, and means for regulating the flow of air to be supplied from the air supplying means, the burner head being made of a heat-resistant porous material having extending therethrough minute channels predominantly up to 100 μm in diameter and giving the burner head a porosity of at least 25%, the burner head being capable of raising the liquid fuel at a rate of at least 0.001 g/cm^1·min to a height of up to 70 mm.

4,229,160

BUNSEN BURNER GUARD

William E. Butler, 401 E. 10th, Eugene, Oreg. 97401

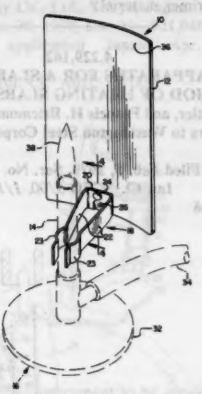
Continuation of Ser. No. 80,549, May 31, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 961,975

Int. Cl.³ F23D *13/40*

U.S. Cl. 431—355 7 Claims

1. In combination with a bunsen burner, a bunsen burner guard comprising:

an elongated clip mounting member having an arcuate fastening portion grasping said burner, and an arcuate, black,



non-reflective shield supported by the member concentrically relative to the arcuate portion,

the mounting member comprising an arm.

4,229,161

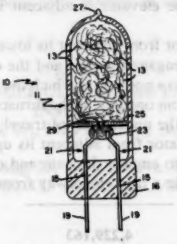
PHOTOFLASH LAMP AND METHOD OF MAKING

Andre C. Bouchard, Peabody, and Lawrence R. Fraley, Ipswich, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 2, 1979, Ser. No. 33

Int. Cl.³ F21K *5/02*

U.S. Cl. 431—362 17 Claims



1. A photoflash lamp comprising:

a hermetically-sealed, light-transmitting envelope including a combustion-supporting atmosphere therein;

a quantity of filamentary combustible material located within said envelope;

ignition means for igniting said combustible material, said ignition means including a pair of electrical conductors sealed within said envelope and projecting therefrom, each of said conductors including an end portion having access to the interior of said envelope, and a mass of primer material located within said envelope in electrical contact with said end portions of said electrical conductors; and

a thin member positioned within said envelope and dividing said envelope into first and second portions, said first portion containing said combustible material and said second portion containing said end portions of said electrical conductors and said primer material and being void of filamentary combustible material, said thin member preventing said combustible material from electrically contacting said end portions and said primer material; means

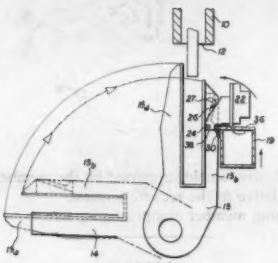
forming a passage between said first and second portions of said envelope for ignition of said filamentary material by said primer material.

4,229,162

CLOSURE APPARATUS FOR A SLAB FURNACE AND METHOD OF HEATING SLABS THEREIN

Richard G. Kotler, and Francis H. Bricmont, both of Pittsburgh, Pa., assignors to Washington Steel Corporation, Washington, Pa.

Filed Feb. 5, 1979, Ser. No. 9,064
Int. Cl.³ F27D *5/00, 1/18*
U.S. Cl. 432—6 **9 Claims**



7. A method for charging a furnace in which a slab is raised into the furnace through a bottom opening by an elevator traveling between upper and lower limits adjacent a cam apparatus, said bottom opening being covered by a door hinged about a horizontal axis and having a cam follower attached thereto, said method comprising:

positioning the cam apparatus laterally adjacent the elevator doors when the elevator is adjacent its lower limit of travel;

raising the elevator from adjacent its lower limit toward its upper limit to engage the cam and the cam follower and pivot the door to a position in which the door substantially covers the bottom opening of the furnace when the elevator is adjacent the upper limit of travel; and

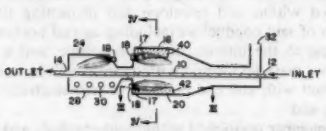
lowering the elevator from adjacent its upper limit toward its lower limit to engage the cam and cam follower and pivot the door in a direction away from the cam.

4,229,163

HEATING FURNACE

Yoshiaki Shinohara, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 25, 1978, Ser. No. 927,850
Claims priority, application Japan, Jul. 25, 1977, 52-89680; Mar. 20, 1978, 53-30937
Int. Cl.³ F27B *7/00*
U.S. Cl. 432—194 **2 Claims**



1. A heating furnace for heating bodies by combustion flame comprising:

conveying means which moves said heating bodies in the heating furnace;

furnace walls which cover said conveying means with said heating bodies;

burners which are attached to said furnace so as to heat said heating bodies by fuel combustion flames; and

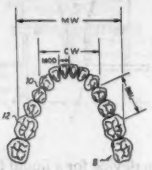
heat transfer converters comprising substantially vertical plate-like heat-resistant materials connected to one another by means of at least one bar material and parallely disposed within and to the flow of the combustion flame of said burners, wherein said heat transfer converters are heated through convection heat transfers from high temperature and high speed flow of said combustion flame to increase the radiation heat transfer to said heating bodies.

4,229,164

ORTHODONTIC METHOD AND MEANS

James H. Robnett, 4630-50th, Suite 505, Lubbock, Tex. 79414

Filed Oct. 16, 1978, Ser. No. 951,625
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—20 **8 Claims**



1. The method of forming the curvature of orthodontic appliances such as arch wires, retainers and positioners wherein the appliance requires an arch shaped portion comprising the steps of:

a. determining the

(i) sum of the mesio-distal diameters of the six anterior teeth,

(ii) cuspid width, and

(iii) molar width of the mandibular arch, then

b. drawing a pattern by

c. drawing an axis line,

d. drawing two cuspid width lines each parallel to the axis and spaced one-half the determined cuspid width from the axis,

e. drawing two molar width lines each parallel to the axis and spaced one-half the determined molar width from the axis,

f. striking a circular arc with the center on the axis and arc length between the cuspid width lines equal to the determined sum of the mesio-distal diameters, and thereafter

g. extending a bi-molar line from each intersection of the arc and the cuspid width line to the molar width line, and

h. forming the arch shaped portion of the appliance to said pattern.

4,229,165

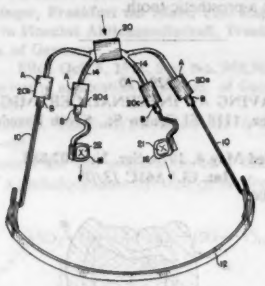
PULSATING ORTHODONTIC APPLIANCE

Craven H. Kurz, 10921 Wilshire Blvd., Suite 512, Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 717,090, Aug. 24, 1976, abandoned. This application Apr. 11, 1978, Ser. No. 895,438
The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—24 **1 Claim**

1. A method for producing orthodontic tooth movement which comprises introducing pressure impulses to the tooth of sufficient amplitude alternately to increase the tissue pressure in the periodontal membrane and adjacent bone tissue and to reduce the tissue pressure in the periodontal membrane and

adjacent bone tissue so as to produce a pump-like action in the area surrounding the tooth cyclically to suck blood and tissue



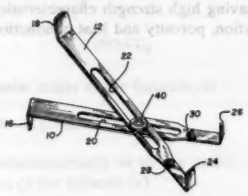
fluid into the area and to expel blood and tissue from the area so as to increase cellular action around the tooth.

4,229,166

PARALLELING TOOL OR GAUGE FOR GENERAL DENTISTRY

Anthony J. Cusato, Closter, NJ, and Jerome J. Goodman, 25 Pinehill Rd., Closter, N.J. 07624, assignors to Jerome J. Goodman, Closter, N.J.

Filed Jun. 20, 1979, Ser. No. 50,302
Int. Cl.³ A61C *19/04*
U.S. Cl. 433—72 **8 Claims**



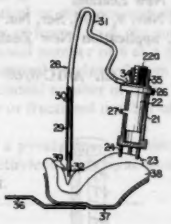
1. A paralleling tool and gauge for dentists and the like, and providing means for manipulating to a desired position and condition to indicate the desired spacing and offset of teeth, said tool including: (a) a pair of blade members arranged in a scissors relationship with at least one of said blades having a longitudinal slot in and through its midlength; (b) a pivot means holding the two blade members in a near contiguous relationship and with this pivot means extending through the slot and enabling longitudinal movement of one blade with the other, this pivot means retaining the blades so as to be moved only against a determined friction and to the selected attitude and position; (c) a movable end member disposed at one of the ends of each blade, each end member having a support surface by which is placed in a contiguous relationship to a selected end surface of the blade and with the end member having a face surface substantially normal to the mounting surface; (d) a pivot means by and with which each end movable member is pivotally secured to the blade member with said pivot means having a determined friction so that the end member may be selectively moved against said friction to a desired position and condition in which the end members are bent and substantially at right angles and the pivot securing means is a rivet extending through holes in the blade member and end member and securing the movable end member so that the upstanding faces of each of the members are in or may be moved to a common plane; and (e) manipulative on the blades are bent ends formed on each blade so that an attendant may move the several components of the assembled tool to the desired condition.

4,229,167

DOWEL PIN SETTING INSTRUMENT

Makoto Kikuchi, and Keijyu Yamada, both of Tokyo, Japan, assignors to Porceny Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 921,049
Claims priority, application Japan, Apr. 12, 1978, 53/47109[U]
Int. Cl.³ A61C *19/00*
U.S. Cl. 433—74 **18 Claims**



1. A dowel pin setting instrument to be attached on an impression material comprising a flexible tube adapted for fitting a dowel pin at one end;

a flexible core wire coaxially inserted in said tube;

supporting means comprising a sleeve having an opening at one end and a rod for insertion into the opening in the sleeve;

engaging means for engaging the rod to the sleeve to prevent the rotation of the rod in a peripheral direction relative to the sleeve when the rod is inserted into the sleeve, and disengaging the rod from the sleeve when the rod is removed from the opening in the sleeve;

connecting means for connecting the other end of the flexible tube to the rod; and

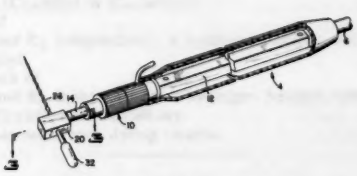
fixing means for fixing the sleeve at its other end at a portion other than a tooth mark formed on the impression material.

4,229,168

CONTRA-ANGLE ULTRASONIC ENDODONTIC INSTRUMENT

Howard W. Scholz, Jr., 1433 Monterey St., San Luis Obispo, Calif. 93401

Filed Aug. 23, 1978, Ser. No. 935,926
Int. Cl.² A61C *1/07, 3/03*
U.S. Cl. 433—124 **5 Claims**



1. A contra-angle ultrasonic endodontic instrument including:

ultrasonic vibration generator means for simultaneously producing both longitudinal and lateral ultrasonic vibrations;

means for actuating the ultrasonic generator means to produce vibrations;

a shaft mechanically coupled to the ultrasonic generator means to vibrate both longitudinal and laterally along its main longitudinal axis;

an endodontic tool of relatively uniform longitudinal and lateral cross-section that is spiraled longitudinally and that is free of indentations along its length; and

means for mechanically coupling the endodontic tool to the shaft with the longitudinal axis of the tool at a substantial angle to the longitudinal axis of the shaft so that the ultrasonic vibrations in the shaft are transmitted to the tool.

4,229,169

DENTAL PROSTHESES FITTING

Peter J. Smith, 6 Kegworth St., and Kishor Bava, 246 High St., both of Eltham, New Zealand

Filed Nov. 9, 1978, Ser. No. 959,149

Claims priority, application New Zealand, Nov. 17, 1977, 185708

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—174 **10 Claims**

1. A dental implant for insertion into a jaw bone, comprising in combination:

(a) a self-tapping metal screw with a head end and an apex end having an anti-rotation means and including a blind hole extending axially from the head end of said screw, said blind hole including a knurled surface in at least a portion thereof; and

(b) a metal post member having one end thereof capable of being anchored by adhesive means within said blind hole and the other end being bifurcated and adapted to be attached to a prosthetic tooth.

4,229,170

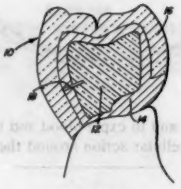
PONTIC HAVING AN INTERNAL CERAMIC CORE

Richard D. Perez, 1118 El Centro St., South Pasadena, Calif. 91030

Filed May 4, 1978, Ser. No. 902,885

Int. Cl.³ A61C *13/08*

U.S. Cl. 433—206 **1 Claim**



1. A pontic, comprising, in combination:

(a) a core constructed from a ceramic material;

(b) a relatively thin metal mass disposed around and embedding the core; and

(c) a covering layer formed of porcelain fused to the metal mass and extending over at least a substantial portion of the metal mass to provide a pontic of lightweight construction having high strength characteristics with minimum distortion, porosity and heat conduction.

4,229,171
PROCESS FOR THE PREPARATION OF FIBER-REACTIVE DYESTUFFS

Fritz Meininger, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

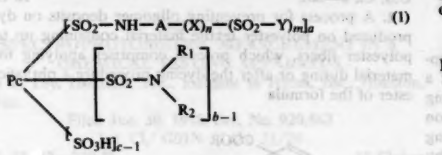
Filed Oct. 5, 1978, Ser. No. 948,907

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1977, 2745480

Int. Cl.[2] **C09B** *62/66, 62/68, 62/74, 62/76*

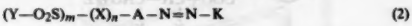
U.S. Cl. 8—661 **6 Claims**

1. A process for the preparation of a fiber-reactive dye mixture of a phthalocyanine dyestuff of the formula (1)



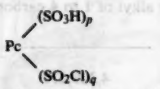
(1)

and an azo dyestuff of the formula (2)



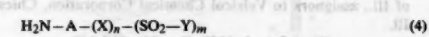
(2)

(each in the form of an acid or as a salt), which comprises reacting a phthalocyanine sulfochloride which in the form of the free acid corresponds to the formula (3)



(3)

with an aromatic amine of the formula (4)

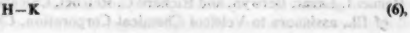


(4)

as such or—simultaneously or in any order—in conjunction with an amine of the formula (v)

(5)

in water or in an organo-aqueous or in an organic solvent at a pH value of from about 4 to about 8 and at a temperature of from about −10° C. to about 100° C., in the presence of an acid binding agent, and subsequently diazotizing unreacted amine of the formula (4) and coupling said diazotized amine with a coupling component of the formula (6)



(6),

wherein:

Pc is a metal-free or metal-containing phthalocyanine, which is unsubstituted except by substituents as indicated in formula (1) which are arranged in the 3- or 4-position of the carbocyclic aromatic nuclei of the phthalocyanine skeleton, or substituted additionally by substituents as indicated in formula (1) which are arranged in the 3- or 4-positions of the carbocyclic aromatic nuclei of the phthalocyanine, or by phenyl or halogen,

A is phenylene or naphthylene which is unsubstituted or substituted by substituents selected from the group consisting of hydroxy, lower alkyl, lower alkoxy, sulfo, carboxy, halogen, nitro, phenylamino, lower alkanoylamine, benzoylamino, phenylsulfonylamino, phenylamino, benzoylamino and phenylsulfonylamino, which are substituted by lower alkyl, lower alkoxy and/or halogen;

X is the group —CH_2— or —$N(CH_3)$—;

Y is vinyl, β-sulfatoethyl or β-hydroxyethyl;

R_1 and R_2 are identical or different and each is hydrogen, unsubstituted or substituted alkyl, or unsubstituted or substituted phenyl or

R_1 and R_2 form a ring together with the nitrogen atom;

m is the number 1 or 2;

n is the number 0 or 1;

a, b and c are identical or different and each is a whole or fractional number of from 1 to 4, the sum of (a+b+c) is a whole or fractional number of 6 at a maximum;

p is a whole or fractional number of from 0 to 3,

q is a whole or fractional number of from 1 to 4, the sum of (p+q) is a whole or fractional number of 4 at a maximum, and

K is the radical of a pyrazolone, an aminopyrazole, a pyridone or of a methylene carboxylic acid arylamide coupling component.

4,229,172
DISPERSE DYEING OF POLYESTER WITH BENZALKETO DERIVATIVES AS CARRIERS: BENZALACETONE, METHYL CINNAMATE ETC.

Hans-Peter Baumann, Ettingen; Hans-Georg Karmann, Binningen, both of Switzerland, and Achim Wiedemann, Weil am Rhein, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

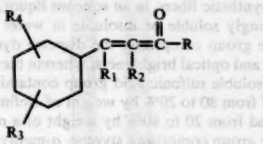
Continuation-in-part of Ser. No. 786,073, Apr. 11, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,562

Claims priority, application Switzerland, Apr. 15, 1976, 4849/76; Jun. 8, 1976, 7186/76

Int. Cl.[2] **D06P** *3/82, 1/68*

U.S. Cl. 8—533 **27 Claims**

1. A method of dyeing a polyester or polyester blend textile material with a disperse dyestuff which comprises exhaust dyeing in a dyebath to which has been added before the introduction of the textile material a dyeing carrier of formula



wherein

R is (C_{1-4})alkyl or (C_{1-4})alkoxy,

each of

R_1 and R_2, independently, is hydrogen, halogen, methyl or ethyl,

and each of

R_3 and R_4, independently, is hydrogen, halogen, hydroxyl, (C_{1-2})alkyl or (C_{1-2})alkoxy,

or a mixture of such dyeing carriers.

4,229,173
PROCESS AND APPARATUS FOR THE CONTINUOUS DYEING OF LENGTHS OF MATERIAL CONSISTING AT LEAST PARTLY OF CELLULOSE FIBERS

Heinz Fleissner, Frankfurt am Main, Fed. Rep. of Germany, assignor to Vepa AG, Switzerland

Filed Jun. 29, 1973, Ser. No. 375,028

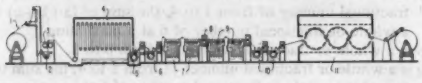
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1972, 2231767

Int. Cl.[3] **D06P** *1/22, 5/20;* **D06B** *1/12, 13/00, 23/24*

U.S. Cl. 8—519 **1 Claim**

1. In a process for the continuous dyeing of lengths of textile material, which, at least partly, contains cellulose fibers by the Pad-Steam process wherein the textile material onto which

dyestuff has been applied is impregnated with chemical reducing agents including an alkaline solution, is transported into a steamer for dyestuff-fixation by steaming therein, is aftertreated by the sequential steps of rinsing with a liquor to remove the alkaline solution, oxidizing the dyestuff in the material with a liquor, and soaping and again rinsing with a liquor to neutralize the material and then is finally dried, the improvement which comprises effecting the rinsing step required for



removing the alkaline solution and the rinsing step after soaping by conveying the material on a perforated surface of a suction drum means and by forcing the appropriate rinsing liquors through the material being conveyed on said suction drum means, removal of the alkaline solution after steaming being effected within the discharge portion of said steamer by the rinsing liquor being forced through the material in direct succession after the steaming whereby the oxygen of the air has no contact with the material.

4,229,174

DISPERSANT FOR TEXTILE DYEING AND OPTICAL BRIGHTENING

Paul Boerzel, Frankenthal; Peter Freyberg, Speyer; Norbert Greif, Bobenheim, and Rudi Widder, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 974,621

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758881

Int. Cl.[2] C09B *67/00*

U.S. Cl. 8—588 **3 Claims**

1. A process for dyeing textile materials, containing natural and/or synthetic fibers, in an aqueous liquor, with dyes which are sparingly soluble or insoluble in water and are selected from the group comprising the disperse dyes, pigment dyes, vat dyes and optical brighteners, wherein the dispersant used is a water-soluble sulfonic acid group containing random copolymer of from 80 to 20% by weight of olefins of 3 to 6 carbon atoms and from 20 to 80% by weight of a monomer selected from the group comprising styrene, α-methylstyrene, nuclear-substituted monohalogenated methylstyrenes, α-ethylstyrene, p-chlorostyrene and p-bromo-styrene, which random copolymers contain from 0.5 to 2 sulfonic acid groups per styrene or substituted styrene unit in the copolymer.

4,229,175

LIME-FREE AND SULFIDE-FREE LIMING PROCESS

France Knaflic, Frankenthal, and Franz-Friedrich Miller, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,835

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714813

Int. Cl.[2] C14C *1/00, 1/08*

U.S. Cl. 8—94.17 **7 Claims**

1. A lime-free and sulfide-free process for liming skins and hides which comprises treating the hair-bearing animal skins or hair-bearing animal hides with a mixture of

(a) sodium hydroxide solution,

(b) at least one sodium salt of dicarboxylic acids of 3 to 6 carbon atoms, and

(c) sodium sulfate,

wherein the sodium hydroxide solution loosens the attachment of the hair to the hides or skins, the proportion of the sodium salt of dicarboxylic acids in the sum of components (b) and (c) being at least 10% by weight, and wherein said components (b) and (c) are agents for controlling swelling of the skins or hides.

4,229,176

PROCESS FOR PREVENTING OLIGOMER DEPOSITS ON DYED POLYESTER TEXTILE MATERIAL

Paul Schäfer, Riehen, and Heinz Abel, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

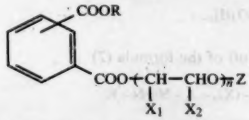
Filed Aug. 7, 1978, Ser. No. 931,579

Claims priority, application Switzerland, Aug. 10, 1977, 9800/77

Int. Cl.[2] D06P *1/18, 1/16, 1/64, 5/02*

U.S. Cl. 8—582 **16 Claims**

1. A process for preventing oligomer deposits on dyeings produced on polyester textile material containing up to 100 polyester fibers, which process comprises applying to said material during or after the dyeing procedure a phthalic acid ester of the formula



(1)

wherein

R is alkyl or alkenyl of 6 to 22 carbon atoms, one of X_1 and X_2, is hydrogen or methyl and the other is hydrogen, Z is hydrogen or alkyl of 1 to 4 carbon atoms, and n is 1 to 4.

4,229,177

DYE COMPOSITIONS

Remus I. Lazar, Berwyn, and Richard C. Reichel, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,169

The portion of the term of this patent subsequent to Sep. 9, 1997, has been disclaimed.

Int. Cl.[3] D06P *1/64, 3/24, 3/14*

U.S. Cl. 8—435 **5 Claims**

1. The dye composition comprising one part by weight C.I. Disperse Blue 79 dye and from 1 to 20 parts by weight of a dye assistant comprising a combination of:

(A) from 10 to 90 parts by weight dicyclopentenyl alcohol and

(B) from 90 to 10 parts by weight of a material selected from the group consisting of butyl and benzoate and dibenzyl ether.

4,229,178

DYE COMPOSITIONS

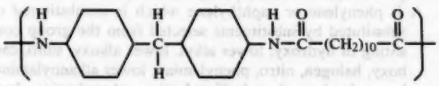
Remus I. Lazar, Berwyn, and Richard C. Reichel, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,170

Int. Cl.[3] D06P *1/651, 3/84, 1/16*

U.S. Cl. 8—583 **5 Claims**

1. A dye composition for synthetic polyamide fibers comprised of forty percent or more of the condensation product of 4,4'-diamino-dicyclohexyl methane and decanodicarboxylic acid having the bias repeating unit:



which comprises:

A. One part of weight C. I. Disperse Blue 79 dye and

B. From 1 to 20 parts by weight of a dye assistant comprised of a combination of:

(a) from about 10 to about 90 weight percent of a mixture of lower alkyl esters of mono- and di-chlorinated benzoic acids; and

(b) from about 90 to about 10 weight percent of a mixture of lower alkyl esters of toluic and benzoic acids.

4,229,179

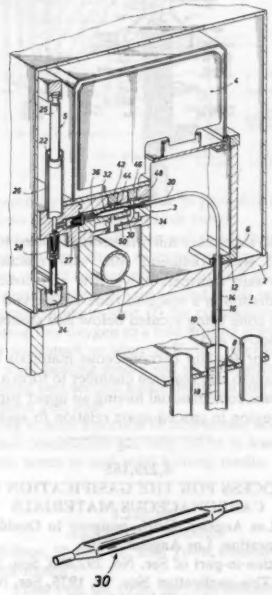
SPECTROPHOTOMETRIC MEASUREMENT IN A CHEMICAL TESTING APPARATUS

Lap Y. Lee, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Jun. 30, 1978, Ser. No. 920,863

Int. Cl.[2] G01N *21/24, 21/26*

U.S. Cl. 23—230 R **16 Claims**



10. A method of analyzing a sample liquid in a chemical testing apparatus comprising the steps of providing a substantially horizontal elongated optically transmissive cuvette defining a liquid flowpath along a longitudinal axis and having a pair of parallel opposed flat surfaces along said longitudinal axis separated by an internal dimension no greater than that which will maintain a meniscus of a leading edge of liquid sample statically occupying said cuvette, moving a liquid having a leading edge defining a meniscus into said cuvette, maintaining said liquid in said cuvette for a predetermined period of time, moving said liquid from said cuvette and moving a sample liquid having a leading edge defining a meniscus into said cuvette, maintaining said sample liquid in said cuvette for a predetermined period of time, directing radiant energy through said sample liquid along a path substantially perpendicular to said flat surfaces of said cuvette while said sample liquid statically occupies said cuvette, and measuring the radiant energy transmitted from said cuvette.

4,229,180

PROCESS AND CATALYST FOR DETERMINING NITROGEN IN A SAMPLE ACCORDING TO THE KJELDAHL PRINCIPLE

Steen R. Christoffersen, Hilleroed, and Ole-Christian Bjarno, Holte, both of Denmark, assignors to A/S N. Foss Electric, Hilleroed, Denmark

Filed Oct. 6, 1978, Ser. No. 949,269

Claims priority, application Denmark, Oct. 7, 1977, 4452/77

Int. Cl.[2] G01N *31/10, 31/16*; B01J *23/16*

U.S. Cl. 23—230 R **17 Claims**

1. A process for determining nitrogen in a sample according to the Kjeldahl principle, comprising catalyzing the sample destruction with an antimonate.

4,229,181

METHOD FOR DETERMINING OIL-RELATED CHARACTERISTICS OF GEOLOGICAL SEDIMENTS FROM SMALL SAMPLES THEREOF

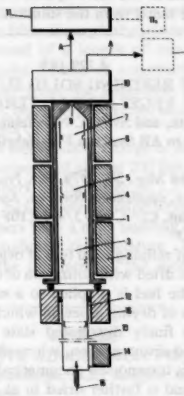
Jean Espitalie, le Vesinet; Jean-Loup Laporte, Rueil Malmaison; Marcel Madec, Suresnes, and Francois Marquis, Saint Prix, all of France, assignors to Institut Francais du Petrole, France

Continuation-in-part of Ser. No. 760,524, Jan. 19, 1977, Pat. No. 4,153,415. This application Sep. 8, 1978, Ser. No. 940,753

Claims priority, application France, Jan. 20, 1976, 76 01765; Nov. 12, 1976, 76 34402

Int. Cl.[2] G01N *31/12*

U.S. Cl. 23—230 EP **12 Claims**



1. A method for rapidly evaluating at least one oil-related characteristic of a geological sediment using a small-sized sample thereof comprising determining the overall amount of hydrocarbons initially present in the sample and the overall amount of hydrocarbon products obtained by pyrolyzing the insoluble organic material contained in the sample, this method comprising the steps of

(a) heating the sample to a first temperature suitable for releasing only the gaseous hydrocarbons initially contained in the sample,

(b) determining a first parameter representative of the amount of these gaseous hydrocarbons,

(c) heating the sample to a second temperature greater than said first temperature and suitable for vaporizing the whole amount of the liquid hydrocarbons initially contained in the sample, without pyrolyzing the insoluble organic material of the sample,

(d) determining a second parameter representative of the amount of said liquid hydrocarbons,

(e) heating the sample to a third temperature greater than said second temperature to pyrolyze the insoluble organic material contained in the sample,

(f) determining a third parameter representing the amount of the hydrocarbon products resulting from this pyrolysis, and

(g) deriving from said third parameter, together with said first and second parameters, the kind of hydrocarbons contained in the geological sediment and the degree of evolution of the insoluble organic material of the sample.

4,229,182

RECOVERY OF ALUMINUM FROM COMPOSITE PROPELLANTS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Graham C. Shaw, Garland, Utah

Filed Sep. 29, 1978, Ser. No. 947,000
Int. Cl.³ B01J *19/00*; B01F *1/00*
U.S. Cl. 23—293 R **9 Claims**

1. A method of recovering metal powder from a solid composite propellant comprising a synthetic polymeric binder containing hydrolyzable cured groups, and less than 15% oxidizer salt comprising the steps of:

dissolving the composite propellant in an active transesterification solvent comprising an alcohol solution of a catalyst and the catalyst being present in an amount of at least 5% by weight based on composite propellant and is an alkali metal alkoxide of the formula MOR where M is an alkali metal and R is an alkyl group containing 1 to 6 carbon atoms whereby the binder is depolymerized into fragments soluble in the solvent; and

separating the metal from the solution.

4,229,183

METHOD OF REFINING SOLID FUEL OF ORGANIC VEGETABLE MATERIAL

Jan-Mats Eneroth, and Sven A. Nordfeldt, both of Vaxjo, Sweden, assignors to AB Svenska Flaktfabriken, Stockholm, Sweden

Filed Mar. 30, 1979, Ser. No. 25,551
Claims priority, application Sweden, Apr. 4, 1978, 7803776
Int. Cl.³ C10L *5/44*; C10F *7/02*
U.S. Cl. 44—1 D **13 Claims**

1. A method of refining solid fuel of organic vegetable material, which fuel is dried with utilization of drying gases, characterized in that the fuel is supplied to a mill together with an adjusted amount of drying gases, in which mill the material is disintegrated to finely distributed state and dried simultaneously with said disintegration, whereafter the dried disintegrated material is transported pneumatically by the drying gas from said mill and is further dried in at least one pneumatic drying step, and the material thereafter is separated from the drying gas to produce refined solid fuel.

3. A method as defined in claim 1, characterized in that the fuel consists of a mixture of one or more of bark, wood shavings, wood chips, other wood waste and peat.

11. A method as defined in claim 1, characterized in that the material is formed to briquets after refining.

4,229,184

APPARATUS AND METHOD FOR SOLAR COAL GASIFICATION

David W. Gregg, Moraga, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1979, Ser. No. 29,962
Int. Cl.³ B01J *3/00*
U.S. Cl. 48—62 R **15 Claims**

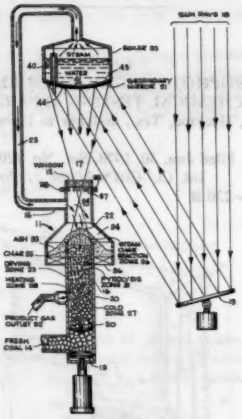
1. A solar coal gasification apparatus comprising:

(a) a gasification reactor comprising a reaction chamber, including means for withdrawing reaction products from said chamber;

(b) a transparent window set in an upper surface of said gasification reactor, said window being transparent to solar radiation;

(c) a secondary mirror having a reflective frontside and a conductive backside disposed in spaced-apart, optically communicating relation to said window;

(d) an array of primary mirrors adapted to reflect and direct said solar radiation onto said secondary mirror, said primary and secondary mirrors being oriented to collect and redirect, solar radiation into said reaction chamber through said transparent window and concentrate said solar radiation in a reaction zone within said reactor said reaction zone being located below and spaced apart from said window; and



(e) means for feeding carbonaceous materials and gaseous reactants into said reaction chamber to form a moving bed of carbonaceous material having an upper surface located in said region in spaced-apart relation to said window.

4,229,185

PROCESS FOR THE GASIFICATION OF CARBONACEOUS MATERIALS

Allan Sass, Los Angeles, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 292,883, Sep. 28, 1972, abandoned. This application Nov. 10, 1975, Ser. No. 630,557
Int. Cl.³ C10J *3/46*
U.S. Cl. 48—197 R **30 Claims**

1. A process for the gasification of particulate carbonaceous material comprising:

(a) introducing into a first pyrolysis zone a particulate carbonaceous feed material, a first gas which is substantially free of free oxygen, and a first solid heating media;

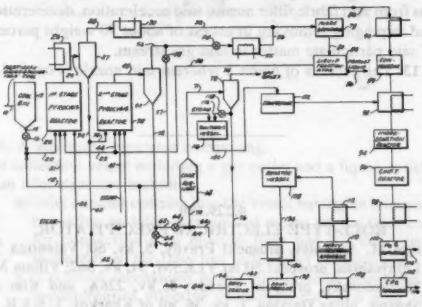
(b) rapidly conducting said first gas, and said first solid heating media, and said particulate carbonaceous feed material through said first pyrolysis zone in turbulent entrained flow to provide for the rapid transfer of heat from said first solid heating media to said particulate carbonaceous feed material to yield first solids and first fluids, said first solids comprising said first solid heating media and a first char product, said first fluids comprising said first gas and a first gaseous product comprising hydrocarbons of from one to four carbon atoms;

(c) separating a portion of said first solids from said first fluids;

(d) introducing into a second pyrolysis zone, a second gas

substantially free of free oxygen, a portion of said first solids, and a second solid heating media;

(e) rapidly conducting said second gas, said first solids, and said second solid heating media through said second pyrolysis zone in turbulent entrained flow to provide for the rapid transfer of heat from said second solid heating media to said first solids to yield second solids and second fluids, said second solids comprising said first solid heating media, a second char product, and said second solid heating media, said second fluids comprising said second gas and a second gaseous product comprising hydrogen and carbon monoxide, said second gaseous product being produced at least in part directly from the devolatilization of the remaining volatilizable matter in said first solid product, and maintaining said second pyrolysis zone free of



free oxygen by preventing free oxygen from being introduced into said second pyrolysis zone;

(f) removing essentially all gases and solids from said second pyrolysis zone in a single entrained stream, and separating a portion of said second solids from said second fluids;

(g) heating said portion of said second solids separated from said second fluids in step (f) by combustion with a gas comprising free oxygen to a first heating temperature high enough to impart to same sufficient thermal energy to form a solid heating media and a combustion gas;

(h) separating said second solids heated in step (g) from said combustion gas; and

(i) recycling at least a portion of said second solids separated from said combustion gas step (h) to at least one of said pyrolysis zones as said solid heating media.

4,229,186

ABRASIVE BODIES

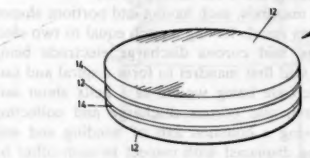
William I. Wilson, 18 East St., East Town, Johannesburg, Transvaal, South Africa

Filed Feb. 28, 1978, Ser. No. 882,808

Claims priority, application South Africa, Mar. 3, 1977, 77/1270

Int. Cl.[2] **B24D** *3/06*

U.S. Cl. 51—297 **21 Claims**



1. A laminated abrasive body comprising a plurality of abrasive compacts joined together to form a laminate; each compact comprising a mass of diamond or cubic boron nitride abrasive particles or a mixture thereof, present in an amount of at least 70 percent by volume of the compact, bonded into a hard conglomerate; the adjacent compacts being joined by means of a layer of a metal or metal alloy braze; the thickness of the laminate exceeding 5 mm and the longest dimension of the body transverse to the thickness exceeding 2 mm.

4,229,187

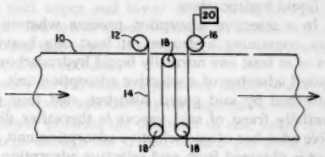
MOVABLE, CONTINUOUSLY CHANGING, SELF-CHARGING ELECTROSTATIC FILTER

William F. Stockford, and Joseph M. Gamewell, both of Salisbury, N.C., assignors to Gamewell Manufacturing, Inc., Salisbury, N.C.

Filed Apr. 9, 1979, Ser. No. 28,524

Int. Cl.[3] **B03C** *3/10;* **B01D** *46/22*

U.S. Cl. 55—14 **2 Claims**



2. A method for separating contaminants from an environment containing weld smoke or the like comprising the steps of:

(a) moving contaminated air from the environment through an air separating device;

(b) at the air separating device passing a movable, self-charing electrostatic filter through the contaminated air, said filter being formed of a length of relatively thin nonwoven filter media formed of a synthetic material constructed of fibers from the polymeric group including polyester, nylon, and polypropylene, said material having the characteristics of:

(i) generating an electrostatic charge in the presence of air moving at a velocity of at least 200 feet per minute, and;

(ii) including fibers in the range of 1.5 to 6 denier in a homogenous mix of substantially 50% large fibers and 50% small fibers with a resin bonding agent distributed evenly throughout the mixture and completely throughout the thickness of the media prior to heat curing.

4,229,188

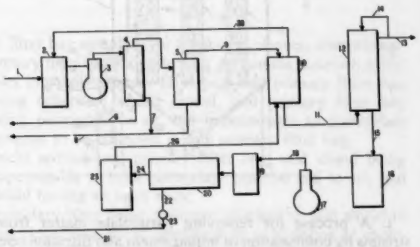
SELECTIVE ADSORPTION PROCESS

George M. Intille, Randolph, N.J., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 18, 1979, Ser. No. 49,515

Int. Cl.[3] **B01D** *53/04, 53/22*

U.S. Cl. 55—16 **27 Claims**



1. In a selective adsorption process wherein a feed gas mix-

ture containing hydrogen, at least one heavier gas and vapors of at least one normally liquid hydrocarbon is directed to a guard adsorber of a selective adsorption unit, vapors of normally liquid hydrocarbons are adsorbed by said guard adsorber, said feed gas mixture substantially freed of said vapors is thereafter directed to a selective adsorber of said selective adsorption unit, a hydrogen product is obtained from said selective adsorption unit and a first purge gas comprising hydrogen is obtained from said selective adsorption unit, the improvement comprising directing said first purge gas to a membrane permeator selectively permeable to hydrogen, recovering from said permeator permeated gas comprising hydrogen, sequentially directing said permeated gas to said guard adsorber, purging said guard adsorber with said permeated gas of at least a portion of said adsorbed vapors, blending the resulting second purge gas from the guard adsorber with said feed gas mixture and recovering at least a portion of said normally liquid hydrocarbon.

15. In a selective adsorption process wherein a feed gas mixture containing hydrogen, at least one heavier gas and vapors of at least one normally liquid hydrocarbon is directed to a guard adsorber of a selective adsorption unit, said vapors are adsorbed by said guard adsorber, said feed gas mixture substantially freed of said vapors is thereafter directed to a selective adsorber of said selective adsorption unit, a hydrogen product is obtained from said selective adsorption unit and at least one desorbed heavier gas and purge gas are joined in a regenerating gas obtained from said selective adsorption unit, the improvement comprising directing said regenerating gas to a membrane permeator selectively permeable to hydrogen, recovering from said permeator a permeated gas comprising hydrogen, sequentially directing said permeated gas to said guard adsorber, purging said guard adsorber with said permeated gas of at least a portion of said adsorbed vapors, blending the resulting second purge gas from the guard adsorber with said feed gas mixture and recovering at least a portion of said normally liquid hydrocarbon.

4,229,189

POLLUTION CONTROL APPARATUS AND METHOD

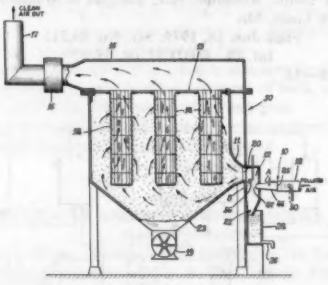
Ladislav J. Pircon, 305 Canterberry La., Oak Brook, Ill. 60521

Continuation-in-part of Ser. No. 816,677, Jul. 18, 1977, Pat. No. 4,120,670, which is a continuation-in-part of Ser. No. 632,648, Nov. 17, 1975, Pat. No. 4,016,609, which is a continuation-in-part of Ser. No. 252,914, May 12, 1972, Pat. No. 3,920,422, which is a continuation-in-part of Ser. No. 190,248, Oct. 18, 1971, Pat. No. 3,853,506. This application Oct. 17, 1978, Ser. No. 952,058

The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.

Int. Cl.[2] B01D *47/06*

U.S. Cl. 55—90 **22 Claims**



1. A process for removing particulate matter from gas streams by combination of impingement and filtration comprising: passing said gas stream having particulate matter therein through the entry of a nozzle; accelerating the gas stream through a converging portion of said nozzle having a mean angle of convergence of about 4 to 8 degrees providing outlet velocities of about 2 to 12 times the entrance velocity; passing said particulate-containing gas stream from the nozzle outlet through an expansion zone decelerating the gas, said acceleration and deceleration of the gas stream causing particulates to agglomerate; impinging said agglomerates and particulates upon a fixed impingement surface of substantially imperforate material thereby separating said particulates and agglomerates from said gas stream; removing said particulates and agglomerates from the expansion zone; separately removing gas having a major portion of original particulate matter removed therefrom from the expansion zone and passing it through fabrice filter means removing a substantial amount of the remaining particulates forming clarified gas; and removing the clarified gas from said fabric filter means; said acceleration, deceleration and impinging removing in excess of about 70 weight percent of said particulate matter in said gas stream.

13. The process of claim 1 wherein said nozzle is conical.

4,229,190

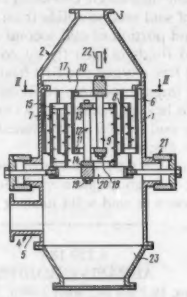
ROLL-TYPE ELECTRICAL PRECIPITATOR

Sergei M. Andoniev, prospekt Pravdy, 5, kv. 60; Valentina Y. Laktjushina, prospekt 50 let VLKSM, 51, kv. 362; Viliam M. Medvedovsky, prospekt Pravdy, 5, kv. 226A, and Kim S. Shuster, ulitsa Darvina, 1, kv. 36, all of Kharkov, U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,404

Int. Cl.[3] B03C *3/00*

U.S. Cl. 55—112 **4 Claims**



1. A roll-type electrical precipitator comprising a housing having:

gas inlet and outlet means;

a strip-like corona discharge electrode having holes;

a strip-like collecting electrode having holes;

first and second mandrels, each having end portions shaped as Archimedean spirals having a pitch equal to two electrode spacings, said corona discharge electrode being wound about said first mandrel to form a spiral and said collecting electrode being wound as a helix about said second mandrel, said corona discharge and collecting electrodes having a common axis of winding and said mandrels being displaced with respect to each other by 180°; and

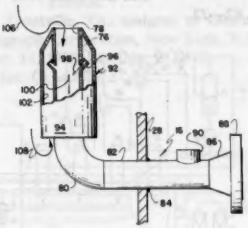
spacers for providing a constant electrode spacing between said corona discharge and said collecting electrodes, said spacers being fixed to the adjacent spiral turns of one of said electrodes and passed through a respective hole of a spiral turn of the other electrode.

4,229,191

TECHNIQUE FOR MODIFYING THE CAPACITY OF GAS-LIQUID SEPARATOR

Lester P. Moore, 233 Hereford, Corpus Christi, Tex. 78408

Filed Aug. 4, 1978, Ser. No. 931,275
Int. Cl.[2] B01D *53/24*
U.S. Cl. 55—203 **7 Claims**



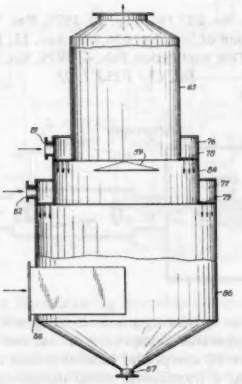
1. A gas-liquid separator comprising:
a collection vessel including a gas outlet and a liquid outlet;
an inlet structure including:
an inlet conduit opening into the vessel having an inlet end providing an inlet opening and means on the inlet end for connection to a mixture flow line for delivering mixture from the flow line to the inlet conduit; and
a corkscrew mechanism in the inlet conduit providing a predetermined effective cross-sectional flow area for centrifugally swirling an incoming mixture;
means for reducing the predetermined effective cross-sectional area of the corkscrew mechanism and thereby increasing the velocity of a given volumn of mixture through the corkscrew mechanism, comprising:
a blocking member insertable through the inlet opening of the inlet conduit when the flow line is removed from the connection means; and
means retaining the blocking member;
the inlet opening of the inlet conduit being sufficiently large to pass the blocking member.

4,229,192

CYCLONIC SCRUBBER WITH PERFORATED PLATE DISTRIBUTOR

Ralph R. Calaceto, 248 Palmer Ct., Ridgewood, N.J. 07450

Filed Jul. 19, 1979, Ser. No. 58,655
Int. Cl.[2] B01D *47/10*
U.S. Cl. 55—238 **22 Claims**



1. An improvement in a cyclonic gas-scrubber including a vertical tower shell having cylindrical portions and introduction port means for introducing a gas stream tangentially into one of said portions thereof for movement in a spiral through said tower shell toward the other of said portions, said improvement comprising:
a cylindrical lower tower shell portion having a height at least twice the diameter thereof, said cylindrical upper tower shell portion having a diameter smaller than that of said lower portion, the bottom of said upper portion being disposed below the top of said lower portion;
a lower annulus joining said lower portion proximate and below the top thereof to said upper portion proximate the bottom thereof, said lower annulus being perforated for spraying liquid or slurry therethrough;
an upper annulus disposed above and spaced apart from said lower annulus and joining said lower portion of said upper portion, said upper and lower tower shell portions and said upper and lower annuli forming an annular compartment around said upper tower shell portion and proximate the bottom thereof; and
conduit means for introducing scrubber liquid or slurry into said compartment and thereby through said lower annulus to said lower portion, the diameter of said upper portion being large enough for transit of said gas stream therethrough with but minimal pressure drop and for effective separation of said scrubber liquid or slurry from said gas stream to occur where the direction of flow of said gas stream is upward.

4,229,193

VACUUM CLEANER AND SEALED FILTER BAG ASSEMBLY THEREFOR PARTICULARLY USEFUL FOR FILTERING ASBESTOS FIBERS FROM AIR

Jonathan Miller, Williamsport, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Continuation of Ser. No. 819,002, Jul. 26, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,637
Int. Cl.[3] B01D *50/00*
U.S. Cl. 55—318 **4 Claims**

4. A filter bag assembly for a vacuum cleaner, comprising:
a primary filter bag for collecting particulate material; a first inlet into said primary filter bag; said primary filter bag being otherwise sealed closed, said primary filter bag being permeable to air, but impermeable to particulate material to be collected in said primary filter bag;
a shield around said primary filter bag; said shield being impermeable to both particulate material and to air; said shield having an open neck;
a secondary filter being sealingly attached to said shield to seal closed said shield open neck so as to define an enclosure comprised of said shield and said secondary filter around said primary filter bag and in which said primary filter bag is wholly enclosed; said secondary filter being

permeable to air but impermeable to the particulate material; a second inlet through said enclosure opening into said enclosure and also communicating with said first inlet; said secondary filter having an outlet side;

a tertiary filter positionable outside said enclosure; said tertiary filter having an inlet side and an outlet side; said tertiary filter being positionable inside said shield open neck and said neck being closed around said tertiary filter, such that the inlet of air and particulate material to said tertiary filter is from said secondary filter and said outlet side of said secondary filter communicates to said inlet side of said tertiary filter; said tertiary filter is positioned at and is surrounded by said attached shield open neck and said secondary filter; at said shield open neck, and the attachment there with said secondary filter, elastic means being provided for drawing said shield open neck closed and thereby squeezing against said tertiary filter.

4,229,194

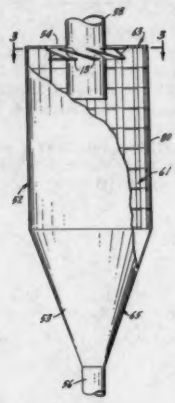
VAPOR-SOLIDS SEPARATING DEVICE

Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Nov. 20, 1978, Ser. No. 962,453

Int. Cl.[2] B01D *45/12*; B01J *8/24, 37/12*

U.S. Cl. 55—397 **7 Claims**



1. An apparatus for separating from a mixture of vapor and solid particles at least a portion of said particles therefrom, said apparatus comprising: a chamber defined by a top, a bottom and at least one peripheral wall, an inlet means for said mixture so situated so as to induce a flow of at least a portion of said particles preferentially toward said peripheral wall, a fluid outlet means, a particle outlet means and a means for reducing the attrition of said portion of said particles comprising a plurality of zones each of which is a partially enclosed space having an opening defined by at least two generally vertical vanes and two generally horizontal vanes acting in cooperation with at least a portion of said peripheral wall, wherein said horizontal vanes comprise a lower vane and an upper vane, wherein at least a substantial portion of the top and bottom edges defined by the surfaces of said vertical vanes overlap at least a portion of the surfaces defined by said horizontal vanes, and wherein there is a means for attaching at least one of said vertical and horizontal vanes to said peripheral wall, said opening being oriented with respect to said peripheral wall so that as said portion of said particles move toward said peripheral wall said particles enter said zone.

4,229,195

METHOD FOR LIQUIFYING NATURAL GAS

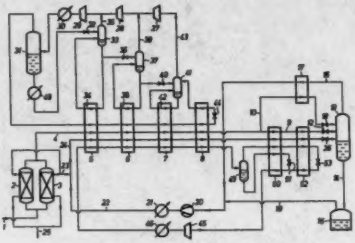
Wolfgang G. Förg, Icking, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Nr. Munich, Fed. Rep. of Germany

Filed May 3, 1979, Ser. No. 35,706

Claims priority, application Fed. Rep. of Germany, May 9, 1978, 2820212

Int. Cl.[3] F25J *3/02*

U.S. Cl. 62—23 **12 Claims**



1. A method for liquefying natural gas, in which a flow of pressurized natural gas is brought into heat exchange with two coolants flowing in closed circuits which are at least partly compressed, liquefied and expanded, the coolant in the first circuit being used to pre-cool the natural gas and the coolant in the second circuit while the coolant in the second circuit is used to liquefy the pre-cooled natural gas; the coolants in said first and second circuits comprising multiple components, after pre-cooling the natural gas down to approximately −50° C., the natural gas is divided into major and minor streams, said major stream being liquefied by heat exchange with the coolant in the second circuit, while said minor stream being liquefied by heat exchange with the flash-gas formed when the liquefied natural gas is expanded and the liquid fraction separated, the flash-gas after heat exchange with said minor stream is compressed and is at least partly liquefied in heat exchange with the coolant in said first and second circuits, and is subsequently expanded and the liquid fraction separated.

4,229,196

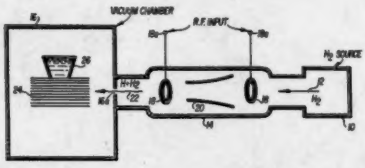
ATOMIC HYDROGEN STORAGE METHOD AND APPARATUS

John A. Woollam, Oberlin, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 837,794, Sep. 29, 1977, Pat. No. 4,193,827, which is a division of Ser. No. 676,432, Apr. 13, 1976, Pat. No. 4,077,788. This application Feb. 6, 1979, Ser. No. 9,887

Int. Cl.[3] F25J *1/02*

U.S. Cl. 62—40 **1 Claim**



1. An apparatus for storing atomic hydrogen in high concentration, said apparatus comprising a vacuum chamber, a delaminated layered compound located in said chamber, said compound being a transitional metal dichalcogenide of the form TX_2 where T is a transition metal and X is a material selected from the group consisting of S, Se or Te, means for

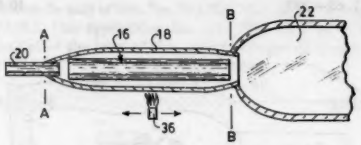
maintaining said compound at a temperature T in the range $0° < T < 14°$ K., and means for impressing a strong magnetic field of at least 1 Tesla per degree Kelvin on said layered compound, atomic hydrogen being collected on the exposed surfaces of said delaminated layered compound.

4,229,197

METHOD FOR MAKING MULTIPLE OPTICAL CORE FIBER

DeWayne A. Streng, Troutville, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,470
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—4 B **7 Claims**



1. A method of producing a multiple optical core preform which can be drawn into a light-conducting fiber, comprising the steps of:

providing a plurality of preforms having central portions of fiber core material and outer portions of fiber cladding material;

assembling said preforms into a bundle;

fusing said bundle of preforms;

providing a fused silica tube having a first end and a second end;

expanding said fused silica tube by means of internal gas pressure and heat;

inserting said fused bundle into said expanded silica tube; and

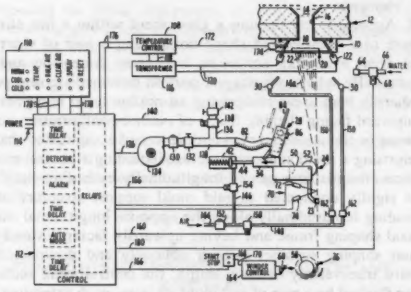
collapsing said silica tube about said bundle to form a substantially solid multiple optical core preform.

4,229,198

APPARATUS FOR DRAWING OF GLASS FIBER

Charles H. Coggin, Jr., Upland, and John L. Jones, Jr., Baldwin Park, both of Calif., assignors to Nitto Boseki Co., Ltd., Tokyo, Japan

Division of Ser. No. 865,961, Dec. 30, 1977, Pat. No. 4,149,865. This application Jan. 25, 1979, Ser. No. 6,382
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—11 W **3 Claims**



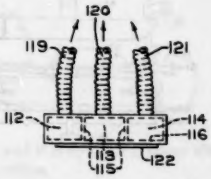
1. In a glass fiber drawing assembly comprising a bushing having an orifice plate with a generally planar undersurface from which fibers are drawn, a supply nozzle for directing bulk gas against the undersurface of the plate, means for applying a binder to fibers being drawn from the orifice plate, means for collecting the binder applicated fibers together to form at least a strand of glass fibers, and a collet spaced beneath the orifice plate for drawing fibers therefrom, the improvement further comprising a detector for sensing the break-out of fibers being drawn from the orifice plate, said detector including a modulated light source disposed beteen the binder applicating means and the collecting means to direct a beam of light against the fibers being drawn from the orifice plate, and a sensor disposed to sense whether the beam is being intercepted by fibers being drawn from the orifice plate, said sensor being responsive only to the modulated beam of the source.

4,229,199

SHAPING GLASS SHEETS BY DROP FORMING WITH DIFFERENTIAL VACUUM RELEASE

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 960,404, Nov. 13, 1978, abandoned. This application May 21, 1979, Ser. No. 41,287
Int. Cl.[3] C03B *23/02*
U.S. Cl. 65—106 **24 Claims**



1. A method of shaping glass sheets, comprising the steps of:

heating a glass sheet to approximately its softening point;

bringing a surface of the glass sheet and a flat platen into close proximity to each other;

drawing a vacuum through the platen so as to retain the glass sheet on the platen;

supporting the platen and the glass sheet carried thereon in an essentially horizontal orientation with the glass sheet under the platen;

bringing into vertical alignment with and beneath the glass sheet held on the platen on a shaping mold having a contour defining the desired contour for the glass sheet;

releasing the vacuum from a portion of the platen adjacent to a first area of the glass sheet while maintaining vacuum in the remaining portion of the platen adjacent to a second area of the glass sheet whereby a sufficient bending force is created in the glass sheet to impart a curvature thereto; and

releasing the glass sheet from the platen so as to fall onto the shaping mold and conform to the contour defined by the shaping mold.

12. An apparatus for shaping glass sheets comprising:

a furnace for heating glass sheets to a softened condition;

a bending station at an exit end of the furnace;

conveyor means for transferring glass sheets heated in the furnace into the bending station;

a platen associated with the bending station, having a plurality of enclosed chambers bounded on a common side by a flat, perforated plate, each of the chambers being in communication with a source of vacuum;

valve means for periodically interrupting the vacuum supply to at least one of said chambers while maintaining vacuum in the remainder of the chambers;

lift means for bringing the perforated plate of the platen and a heated glass sheet in the bending station into close proximity to each other so that vacuum in the platen may retain the glass sheet thereon, and for bringing the perforated plate and the glass sheet thereon to a generally horizontal orientation with the perforated plate facing downwardly;

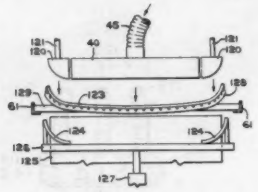
a shaping mold having upwardly facing shaping surfaces defining the desired curvature and corresponding to the shape of the glass sheets; and

shuttle means for alternately bringing the platen and the shaping mold into and out of superimposed vertically spaced relationship to each other, wherein the shaping mold in the superimposed position is supported at an elevation below the perforated plate so as to receive and shape a glass sheet dropped from the platen.

4,229,200
DROP FORMING GLASS SHEETS WITH AUXILIARY SHAPING MEANS

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 960,404, Nov. 13, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,443
Int. Cl.³ C03B *23/02*
U.S. Cl. 65—106 **13 Claims**



1. A method of shaping glass sheets comprising the steps of:

heating a glass sheet to approximately its softening point;

bringing a major portion of a surface of the glass sheet into close proximity to a flat platen with a portion of the glass sheet extending beyond a side of the platen;

drawing a vacuum through the platen so as to retain the glass sheet on the platen;

engaging the extending portion of the glass sheet with shaping means so as to pre-shape the extending portion of the glass sheet;

bringing the glass sheet on the platen to an elevated essentially horizontal orientation with the glass sheet on the underside of the platen;

bringing into vertical alignment with and beneath the glass sheet held on the platen a shaping mold having a contour defining the desired contour for the glass sheet; and

releasing the glass sheet from the platen so as to fall onto the shaping mold and conform to the contour defined by the shaping mold.

9. An apparatus for shaping glass sheets comprising:

a furnace for heating glass sheets to a softened condition;

support means adjacent the furnace for supporting heated glass sheets;

conveyor means for transferring glass sheets from the furnace to the support means;

a platen having a flat, perforated plate on one side thereof and an enclosed interior space in communication with a source of vacuum;

means for bringing the flat, perforated plate and a side of a glass sheet into close proximity to each other so as to transfer support of a major portion of the glass sheet from the support means to the platen with a portion of the glass sheet extending beyond a side of the platen;

shaping means aligned with the extending portion of the glass sheet and adapted to engage and pre-shape the extending portion of the glass sheet;

means for bringing the pre-shaped glass sheet on the platen into a generally horizontal orientation, with the glass sheet on the underside of the platen;

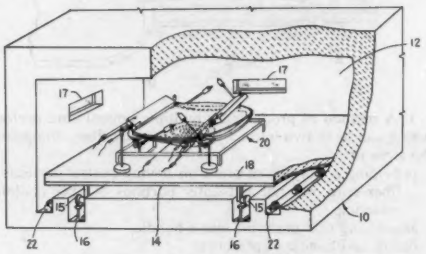
a shaping mold having upwardly facing shaping surfaces defining the desired curvature and corresponding to the shape of the glass sheet; and

shuttle means for alternately bringing the platen and the shaping mold into and out of superimposed, vertically spaced relationship to each other, wherein the shaping mold in the superimposed position is supported at an elevation below the platen so as to receive and shape a glass sheet dropped from the platen.

4,229,201
APPARATUS FOR BENDING GLASS SHEETS TO COMPLICATED CURVATURES USING LOCALIZED SUPPLEMENTARY HEATING

John A. Comperatore, Natrona Heights; Edward D. Black, Brackenridge, and David J. Wise, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1979, Ser. No. 25,137
Int. Cl.² C03B *23/02*
U.S. Cl. 65—287 **10 Claims**



1. Apparatus for shaping a glass sheet to a complex shape having sharply bent end portions and a substantially spherically bent central portion, comprising:

an outline shaping frame having an upwardly facing shaping surface conforming in elevation and outline to the periphery of the bent glass sheet;

first and second elongated heating elements supported above the shaping frame at an elevation above and closely adjacent to the elevation assumed by an unbent glass sheet loaded onto the shaping frame, and extending across respective end portions of the frame in alignment with the desired locations for the sharp bends; and

a third heating element of extended area supported below the shaping frame at an elevation below and closely adjacent to the elevation assumed by the bent glass sheet, and aligned with a central portion of the area circumscribed by the shaping frame between the first and second heating elements.

9. Apparatus for shaping a glass sheet within a hot atmosphere to a complicated shape comprising a pair of sharply bent areas extending across its transverse dimension and a substantially spherically sagged portion intermediate said pair of sharply bent areas comprising an outline mold comprising an upward facing shaping frame of outline configuration conforming in elevation and plan outline to said complicated shape comprising a mold support structure including a central mold section comprising a pair of longitudinally extending shaping rails rigidly connected to said mold support structure and extending longitudinally along the opposite longitudinal sides of said shaping frame and having upwardly facing, extended, planar shaping surfaces sloping obliquely and downwardly inward transversely of their length, the central mold section being flanked by a pair of end mold sections, each extending in plan outline to enclose the ends of said shaping frame and having upwardly facing, extended, planar shaping surfaces sloping obliquely and downwardly inward transversely of their length, means hingedly connecting each said end mold section to said mold support structure to permit said end mold sections to pivot outwardly to a spread mold position to support the ends of a flat glass sheet for bending, and means con-

nected to each end mold section to pivot the latter into a closed mold position wherein said end mold sections are in end to end relation with the longitudinal ends of said longitudinally extending shaping rails of said center mold section to provide a substantially continuous shaping frame conforming in elevation and plan outline to the shape desired for the margin of the bent glass sheet and sloping obliquely and downwardly inwardly transversely of its length.

4,229,202

WASTEWATER TREATMENT WITH ULTRAVIOLET DISINFECTION AND INCREASED CAPACITY

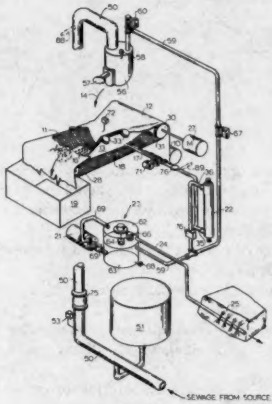
Steven B. Mullerheim, Walnut Creek, and Fred G. Williams, San Anselmo, both of Calif., assignors to Great Circle Associates, Walnut Creek, Calif.

Continuation-in-part of Ser. No. 752,201, Dec. 20, 1976, Pat. No. 4,137,062. This application Jan. 29, 1979, Ser. No. 7,209

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.[2] C02C *1/00, 1/40*

U.S. Cl. 71—8 **31 Claims**



15. A process for treating fresh sewage containing organic liquid and solid wastes, comprising:

separating the solids from the liquids while the sewage is fresh, through an organic compostible filter medium, to produce a liquid component low in suspended solid material;

exposing the liquid component to ultraviolet radiation including germicidal wavelength, to destroy pathogens but not beneficial nutrients present in the liquid component;

introducing ozone in the liquid component to react with pathogens to form stable compounds and to produce residual hydrogen peroxide for deterring subsequent pathogen growth;

dispersing the nutrient-rich treated liquid component to unsaturated ground; and

composting the separated solids along with used filter medium.

4,229,203

PHOSPHORUS COMPOUNDS AS SUGARCANE RIPENERS

Sidney R. Siemer, Fresno, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,958

Int. Cl.[3] A01N *57/12, 57/14*

U.S. Cl. 71—86 **13 Claims**

1. A process for modifying the ripening of sugarcane plants so as to increase their yield of sucrose which comprises applying a phosphorus compound in a sucrose increasing amount directly to the cane plants at a time from about 2–10 weeks prior to harvest; said phosphorus compound being selected from the group consisting of diphenylchlorophosphate; phenyldichlorophosphate; triethylphosphite; dimethylphosphite; triphenylphosphite; 2-cyanoethylphosphate, barium salt dihydrate; and bis(2,2,2, trichloroethyl) chlorophosphate.

4,229,204

TRIFLUOROMETHYLPHENYL ISOXAZOLYL BENZOATES

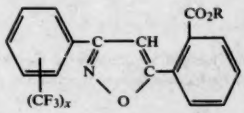
Robert K. Howe, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 907,069, May 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 796,248, May 12, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,403

Int. Cl.[2] C07D *261/08;* H01N *9/28*

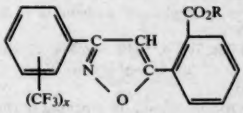
U.S. Cl. 71—88 **23 Claims**

1. A compound having the formula



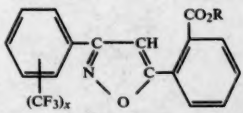
wherein x is 1 or 2; and R is hydrogen, lower alkyl or agriculturally acceptable cations.

7. A method for preventing the growth of undesirable vegetation which comprises applying to said vegetation or the locus thereof a herbicidally effective amount of a compound having the formula



wherein x is 1 or 2; and R is hydrogen, lower alkyl or agriculturally acceptable cations.

13. A method of regulating the growth of desirable plants which comprises applying to said plants an effective amount of a compound having the formula



wherein x is 1 or 2; and R is hydrogen, lower alkyl or agriculturally acceptable cations.

4,229,205

SUBSTITUTED ALKOXYIMINO-PYRIDAZONES, THEIR MANUFACTURE, AND THEIR USE AS HERBICIDES

Hans Theobald; Bruno Wuerzer, both of Limburgerhof, and Karl Kiehs, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

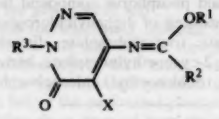
Filed Apr. 30, 1979, Ser. No. 34,857

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821809

Int. Cl.[2] C07D *237/22;* A01N *9/22*

U.S. Cl. 71—92 **3 Claims**

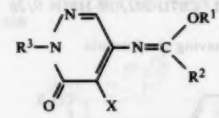
1. A pyridaz-6-one compound of the formula



I,

where X denotes halogen, R^1 denotes C_1–C_6-alkyl, R^2 denotes H, C_1–C_6-alkyl or haloalkyl, and R^3 denotes phenyl or cyclohexyl.

2. A process for combating unwanted plant growth, wherein the plants or the soil are treated with a herbicidally effective amount of a composition containing from 0.1 to 95% by weight of a compound of the formula



I,

where X denotes halogen, R^1 denotes C_1–C_6-alkyl, R^2 denotes H, C_1–C_6-alkyl or haloalkyl, and R^3 denotes phenyl or cyclohexyl.

4,229,206

S-TRIAZINES AS SUGARCANE RIPENERS

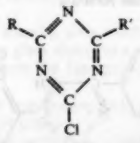
Sidney R. Siemer, Fresno, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 72,000

Int. Cl.³ A01N *43/70*

U.S. Cl. 71—93 **14 Claims**

1. A process for modifying the ripening of sugarcane plants so as to increase their yield of sucrose which comprises applying an s-triazine in a sucrose increasing amount directly to the cane plants as hereinafter specified at a time from about 2–10 weeks prior to harvest; said s-triazine having the formula



(a) in which R is EtNH—, R′ is $—N(CH_2COOMe)_2$, and the sugarcane variety is CL-59-1052 or CL-41-223;
(b) in which R is EtNH—, R′ is $—N(CH_2CONH_2)_2$, and the sugarcane variety is CL-59-1052;
(c) in which R is EtNH—, R′ is $—HNCH_2COOEt$, and the sugarcane variety is CL-59-1052;
(d) in which R is EtNH—, R′ is $—N(CH_2COOH)_2$, and the sugarcane variety is CL-59-1052;
(e) in which R is iPrNH—, R′ is $—HNCH_2COOH$, and the sugarcane variety is CL-59-1052;
(f) in which R is iPrNH—, R′ is $—N(CH_2COOBu)_2$, and the sugarcane variety is CL-59-1052;
(g) in which R and R′ are $—N(CH_2COOH)_2$, and the sugarcane variety is CL-59-1052; or
(h) in which R and R′ are $—N(CH_3)CH_2COOH$, and the sugarcane varieties are CL-59-1052 or CL-41-223.

4,229,207

ESTERS OF 1,2-DIPHENYL-CYCLOHEX-1-ENE-4-CARBOXYLIC ACID

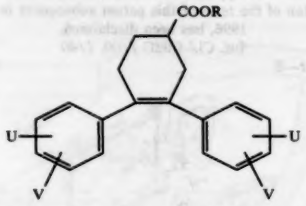
Verena Laanio, Arisdorf; Werner Föry, Basel, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 713,477, Aug. 11, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,212

Int. Cl.² A01N *9/24*

U.S. Cl. 71—107 **9 Claims**

1. A method for controlling *Avena fatua* (wild oats) in cultures of cereal which comprises applying to cereal fields infested with the weed *Avena fatua* in post-emergence application a herbicidally effective amount of an ester of 1,2-diphenyl-cyclohex-1-ene-4-carboxylic acid of the formula



wherein R is
C_1–C_7 alkyl, optionally substituted by halogen, C_1–C_4 alkoxy, C_3–C_8 cycloalkyl, by phenyl or phenoxy unsubstituted or substituted by chlorine, bromine, C_1–C_4 alkyl or C_1–C_4 alkoxy;
C_3–C_7 alkenyl, optionally substituted by chlorine, bromine or C_1–C_4 alkyl;
C_3–C_6 cycloalkyl optionally substituted by chlorine, bromine or methyl;
phenyl or benzyl unsubstituted or substituted by chlorine, bromine, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro or trifluoromethyl;
and U and V are hydrogen, chlorine, bromine, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro or trifluoromethyl.

4,229,208

DIURETHANES WITH SELECTIVE HERBICIDAL ACTION

Gerhard Boroschewski, and Friedrich Arndt, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

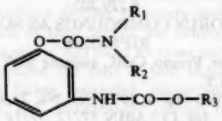
Filed Mar. 11, 1975, Ser. No. 557,286

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413933

Int. Cl.³ A01N *9/20*

U.S. Cl. 71—111 **1 Claim**

1. The method for the control of weed growth in cotton fields which comprises treatment of said fields with a herbicidally effective amount of a composition comprising from about 20 to about 80 weight percent of a compound having the formula:



wherein R_1 is ethyl or allyl; R_2 is phenyl, alkylphenyl having from 1 to 3 carbons in the alkyl group, alkoxyphenyl having from 1 to 3 carbons in the alkoxy group, or halophenyl; and R_3

is methyl or ethyl at a rate sufficient to provide between about 0.5 and 5 kg of said compound per hectare.

4,229,209

PROCESS FOR BENEFICIATING GOLD

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 658,259, Feb. 17, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 873,148

Int. Cl.[2] C22B *1/00, 11/00*

U.S. Cl. 75—1 R **19 Claims**

1. A process for beneficiating particulate gold from foreign material with which it is mixed which comprises contacting the mixture with an iron carbonyl under conditions which cause the iron carbonyl to decompose and then cause a coating at the surface of the gold particles to the substantial exclusion of the foreign material so as to alter the surface characteristics of the gold particles thereby causing a selective enhancement of the magnetic susceptibility of the gold particles to the substantial exclusion of the foreign material so that a magnetic separation between the gold and foreign material may be effected.

8. A process for beneficiating gold mixed with foreign material, which comprises the steps of:

(a) reducing the mixture to a particulate form;

(b) placing the particulate mixture in a gas treatment chamber;

(c) introducing iron carbonyl vapor into said chamber under conditions which preclude substantial non-selective decomposition of the iron carbonyl, and

(d) maintaining the iron carbonyl vapor in contact with said mixture for a sufficient time for the iron carbonyl to selectively enhance the magnetic susceptibility of substantially all of the gold particles in the mixture.

4,229,210

METHOD FOR THE PREPARATION OF THIXOTROPIC SLURRIES

Joseph Winter, New Haven; Derek E. Tyler, Cheshire, and Michael J. Pryor, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 12, 1977, Ser. No. 859,132

Int. Cl.[3] C22D *7/06*

U.S. Cl. 75—10 R **6 Claims**

1. A process for producing a thixotropic metal or alloy composition containing discrete degenerate dendritic primary solid particles homogeneously suspended in a secondary phase having a lower melting point than said primary solid particles which comprises the steps of:

(1) heating a metal or alloy to produce at least a partially liquid mixture comprising between 20 and 80% volume fraction primary solid particles;

(2) supplying a current in the range of 500 to 10,000 amps to an AC induction coil at a frequency in the range of from 60 to 10,000 cps to form an induced electromagnetic force field of sufficient intensity to vigorously agitate said partially liquid mixture;

(3) placing said partially liquid mixture within said induced electromagnetic force field;

(4) holding said partially liquid mixture within said induced electromagnetic force field for sufficient duration to vigorously agitate said partially liquid mixture so as to convert said primay solid particles to discrete degenerate dendrites of substantially spheroidal configuration; and

(5) simultaneously cooling said partially liquid mixture during said holding step at a cooling rate determined so as to counteract the heating effect of the induced current of said electromagnetic force field and maintain said volume fraction of primary solid particles.

4,229,211

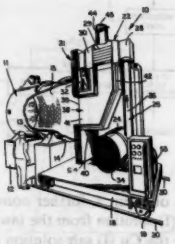
LADLE HEATING SYSTEM

Donald D. Battles, Atlanta, Ga., assignor to The Cadre Corporation, Doraville, Ga.

Continuation-in-part of Ser. No. 22,687, Mar. 21, 1979. This application Nov. 8, 1979, Ser. No. 92,374

Int. Cl.[3] F27B *14/14*

U.S. Cl. 75—46 **22 Claims**



1. Apparatus for heating a ladle or the like which includes a chamber with an opening and a rim about the opening, said apparatus comprising a seal assembly for sealing engagement with the rim of the ladle, said seal assembly comprising a support frame of greater breadth than the rim of the ladle, a plurality of refractory fiber modules mounted on said support frame approximately in a common plane, each said module being compressible and held in lateral compression by said frame and by lateral engagement with one another and said plurality of modules positioned on said support frame to sealingly engage the rim of the ladle, a heat exchanger mounted adjacent said seal assembly, air conduit means extending through said heat exchanger and through said seal assembly for directing air through the heat exchanger, through said seal assembly and into the ladle in sealing engagement with the seal assembly, an exhaust gas conduit means extending through said seal assembly and through said heat exchanger for directing exhaust gases from the ladle in sealing engagement with said seal assembly through said seal assembly and through said heat exchanger, blower means for inducing a stream of air through said air conduit means and a stream of exhaust gases through said exhaust gas conduit means, burner means for supplying fuel to said air conduit means and for directing a flame into the ladle in sealing engagement with said seal assembly.

4,229,212

RECOVERY OF COPPER FROM MATERIALS CONTAINING COPPER AND ACID SOLUBLE IRON COMPOUNDS

Alan J. Parker, South Perth, and David M. Muir, Palmyra, both of Australia, assignors to Anumin Pty. Ltd., Canberra, Australia

Continuation of Ser. No. 760,330, Jan. 18, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,566

Claims priority, application Australia, Jan. 19, 1976, PC4557; Feb. 27, 1976, PC5034

Int. Cl.[3] C22B *15/00*

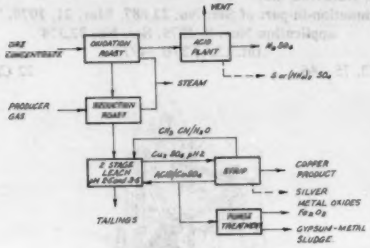
U.S. Cl. 75—101 R **12 Claims**

1. A method of preventing acid soluble iron from entering solution while preparing a solution of Cu(I) salts from a material containing both copper and acid soluble iron comprising the steps of:

(a) leaching said material with an acidic aqueous solution containing a Cu(II) salt and an organonitrile selected from the group consisting of acetonitrile, 2-hydroxycyanoethane, acrylonitrile and propionitrile, the amount of nitrile being sufficient to stabilize the resulting Cu(I) solution; and

(b) controlling the ratio of Cu(II) to Cu(I), while maintaining

the pH of the solution between about 2 and 5, to ensure that acid soluble iron does not dissolve as Fe(II).



10. The method of claim 1, further comprising the steps of separating the Cu (I) solution from the insoluble materials and disproportionating the Cu (I) salt solution to produce particulate copper.

4,229,213

HYDROMETALLURGICAL RECOVERY OF NICKEL VALUES

Yoon T. Auck, Tucson, Ariz., assignor to UOP Inc., Des Plaines, Ill.

Filed May 7, 1979, Ser. No. 36,486
Int. Cl.³ C22B *23/04*
U.S. Cl. 75—103 **9 Claims**

1. A method for the recovery of nickel from a nickel bearing source which comprises treating said source with at least one additive selected from the group consisting of hydrogen halide and a sulfur containing compound, subjecting said treated source to a reductive roast in contact with a reducing gas at a temperature in the range of from about 700° to about 1300° F., maintaining during said roast an annealing temperature at a constant degree for a period of time of from about 1 to about 20 minutes, cooling said source upon completion of said roast, extracting the cooled source with an ammoniacal ammonium compound, and recovering the desired nickel.

4,229,214

PROCESS FOR COMBINED PRODUCTION OF FERROSILICOZIRCONIUM AND ZIRCONIUM CORUNDUM

Boris A. Shushlebin, Sirenevy bulvar, 27, korpus 3, kv. 53; Nikolai P. Lyakishev, 1 Parkovaya ulitsa, 8, kv. 51, both of Moscow; Viktor V. Tregubenko, ulitsa Zavodskaya, 6, kv. 2 Krasnogorsk, Moskovskaya oblast; Gennady F. Ignatenko, ulitsa Klubnaya, 9, kv. 19, and Nikolai I. Subbotin, ulitsa Klubnaya, 9, kv. 3, both of poselok Dvurechensk, Sverdlovskaya oblast, all of U.S.S.R.

Filed May 30, 1979, Ser. No. 43,956
Int. Cl.² C22B *5/00*; C22C *28/00*
U.S. Cl. 75—133 **1 Claim**

1. A process for combined production of ferrosilicozirconium and zirconium corundum which comprises melting a zirconic concentrate, iron ore and aluminum in a weight ratio 51–69:9–16.5:19.8–34.8 respectively, at a temperature of 1950° to 2000° C. to form a melt having an upper layer of zirconium corundum and a lower layer of ferrosilicozirconium, adding to said melt from 0.5 to 50% by weight of zirconic concentrate of alumina and subsequently casting the upper and lower layers separately.

4,229,215

NON-PRECIOUS STAINLESS DENTAL ALLOY

Emil M. Prosen, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posen, Ill.

Filed Jun. 22, 1979, Ser. No. 51,003
Int. Cl.² C22C *19/07*
U.S. Cl. 75—134 C **4 Claims**

1. A stainless dental alloy especially adapted for the adhesion of opaqueing porcelain having a fusing temperature of approximately 1800° F., consisting essentially of:

Cobalt	49 to 59%
Chromium	25 to 30%
Tungsten	7 to 14%
Gallium	2 to 6%
Copper	1 to 3%
Niobium	0.5 to 2%
Silicon	0.5 to 2%
Iron	0.5 to 6%

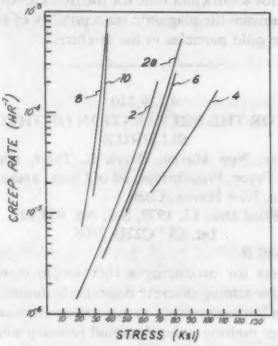
said alloy having a melting temperature of approximately 2550° F., and a linear coefficient of expansion of about 1.4×10^{-5} per °C.

4,229,216

TITANIUM BASE ALLOY

Neil E. Paton, Thousand Oaks, and Cecil G. Rhodes, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 22, 1979, Ser. No. 13,992
Int. Cl.² C22C *14/00*
U.S. Cl. 75—175.5 **4 Claims**



1. A titanium base alloy consisting essentially of about 7.5 to 12% aluminum, about 4 to 10% zirconium, about 4 to 7% columbium, up to about 0.5% silicon, and balance titanium and impurities.

4,229,217

METHOD OF PRODUCING POROUS METAL BODIES FOR USE IN THE ELECTRONIC INDUSTRY

Reinhard Hähn, Langelsheim, Fed. Rep. of Germany, assignor to Hermann C. Starch, Berlin, Fed. Rep. of Germany

Division of Ser. No. 769,603, Feb. 17, 1978, Pat. No. 4,154,609.
This application Nov. 20, 1978, Ser. No. 961,901
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610224
Int. Cl.² B22F *1/100, 3/00*
U.S. Cl. 75—244 **11 Claims**

1. A method of producing a porous sintered metal body which comprises molding under pressure metal powder to form a molded body and sintering said molded body, said metal being selected from the group consisting of Groups IVB, VB

and VIB of the Periodic Table, which comprises prior to the molding step mixing with the metal powder about 0.01 to about 10% by weight of at least one inorganic lubricant selected from nitrides of boron and silicon, whereby the sintered metal bodies still contains 2% to 70% by weight of the inorganic lubricant.

7. A mixture for forming molded sintered bodies which comprises a powdered base metal selected from the group consisting of Groups IVB, VB and VIB of the Periodic Table and at least one inorganic lubricant selected from nitrides of boron and silicon, said lubricant being present in an amount of 0.01 to about 10% by weight.

4,229,218

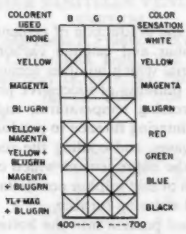
SELF-MONITORING ELECTROLESS PLATING SOLUTION

Michael Gulla, Sherborn, Mass., and Barry J. Hartnett, Nashua, N.H., assignors to Shipley Company Inc., Newton, Mass.

Filed Feb. 5, 1979, Ser. No. 9,542

Int. Cl.[3] C23C *3/02*

U.S. Cl. 106—1.23 **11 Claims**



1. In a solution capable of depositing metal over a catalytic surface in the absence of electricity comprising a source of the plating metal, a reducing agent therefore, a complexing agent and a pH adjustor, the improvement comprising a soluble colorant in an amount sufficient to produce a color change in the solution relative to the concentration of the plating metal wherein said colorant is of substantially fixed optical density in solution, does not adversely react with the other components in solution and absorbs and transmits light in portions of the spectrum differing from those portions of the visible spectrum where the dissolved plating metal in solution absorbs and transmits light.

4,229,219

INKS FOR INK JET PRINTING

Eric A. Metz, Gilroy, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,427

Int. Cl.[3] C09D *11/02*

U.S. Cl. 106—22 **3 Claims**

1. An ink for use in ink jet printing comprising an aqueous solution of both crystal violet and the n-butyl ether of diethylene glycol, wherein the crystal violet is present in the amount of from about 0.10% to about 10% by weight and the n-butyl ether of diethylene glycol is present in an amount of from about 1% to about 20% by weight.

4,229,220

EDGE-COATING GLASS FOR LASER DISKS

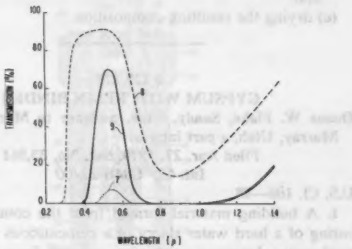
Shinichiro Hirota, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 937,642, Aug. 28, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,413

Claims priority, application Japan, Aug. 31, 1977, 52/104664

Int. Cl.[2] C03C *3/16*

U.S. Cl. 106—47 R **1 Claim**



1. A glass for coating a laser glass, having a high absorption for laser light consisting essentially of, in mol %, 51 to 59 % P_2O_5; 0 to 8% B_2O_3; 4 to 10% Al_2O_3; 0 to 19% Li_2O; 0 to 16.5% Na_2O; 8.5 to 19% Li_2O+Na_2O; 0 to 23% ZnO; 0 to 14.5% BaO; 7.5 to 28% CuO; and 0 to 12.5% V_2O_5.

4,229,221

METHOD FOR PRODUCING REFRACTORIES

Seiichi Uemura; Syunichi Yamamoto, both of Kawasaki; Takao Hirose, Kamakura; Hiroaki Takashima, Kawasaki; Osamu Kato, Yokohama, and Minoru Nagai, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd. and Shinagawa Refractories Co., Ltd., both of Tokyo, Japan

Filed Jan. 15, 1979, Ser. No. 3,761

Claims priority, application Japan, Jan. 18, 1978, 53-4105; Jan. 18, 1978, 53-4106

Int. Cl.[2] C04B *35/04*

U.S. Cl. 106—58 **8 Claims**

1. A method for producing unburned refractories which comprises the steps; continuously feeding a heavy oil having a boiling point more than 150° C. obtained by thermal cracking or steam cracking of petroleum hydrocarbons as a raw material oil in a first stage stirring vessel maintained at a pressure of more than 2 Kg/cm^2G and at a temperature in the range of from 300° to 360° C.; maintaining the average residence time of said raw material oil at a time of more than 15 minutes; continuously withdrawing a first stage treated oil from said first stage stirring vessel; supplying said first stage treated oil in a second stage stirring vessel maintained at a temperature from 370° C. to 450° C.; continuously withdrawing a second stage treated oil from said second stage stirring vessel while maintaining the average residence time of said oil therein at a time of from 30 minutes to 10 hours; continuously obtaining a pitch by eliminating lighter components from said second stage treated oil; and producing unburned refractories by mixing said pitch with basic refractory materials.

4,229,222

EARTHEN CEMENT COMPOSITIONS FOR BUILDING MATERIALS AND PROCESS

Gordon L. Schneider, 4236 Cottage Cir. #3, Las Vegas, Nev. 89109

Filed Jul. 28, 1978, Ser. No. 928,798

Int. Cl.[2] C04B *43/12*

U.S. Cl. 106—74 **9 Claims**

1. A process for producing an improved earthen composition comprising:

(a) preparing an aqueous hydroxide solution selected from

the group consisting of sodium hydroxide, potassium hydroxide, and mixtures thereof,

(b) adding cellulose to said aqueous hydroxide solution and agitating the mixture to separate cellulose fibers throughout the mixture,

(c) blending the product of (b) with soil until a substantially homogeneous mixture is achieved having a pH of between about 12.5 and 13.5,

(d) adding and mixing sodium silicate to said mixture of (c), and

(e) drying the resulting composition.

4,229,223

GYPSUM WITH RESIN BINDER

Duane W. Flake, Sandy, Utah, assignor to Mary W. White, Murray, Utah, a part interest

Filed Apr. 27, 1979, Ser. No. 33,961

Int. Cl.[2] C04B *21/00*

U.S. Cl. 106—88 **6 Claims**

1. A building material formed from the combination and curing of a hard water slurry of a cementitious material and hard water detergent containing resinous foam wherein the resin is selected from the group consisting of urea-formaldehyde, phenol-formaldehyde and melamine-formaldehyde resins and consisting of about 99.5 to 85 percent of said cementitious material intimately combined with from about 0.5 to 15 percent by weight of said foamed resin and also containing calcium and magnesium ions from said hard water and detergent from said resinous foam.

4,229,224

CEMENTITIOUS COMPOSITIONS

David G. Dawson, High Wycombe; Desmond W. J. Osmond, Windsor; Maurice W. Skinner, Maidenhead, and Edmund J. West, High Wycombe, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1979, Ser. No. 14,247

Claims priority, application United Kingdom, Feb. 22, 1978, 7041/78; Nov. 20, 1978, 45296/78

Int. Cl.[2] C08L *00/00*

U.S. Cl. 106—90 **13 Claims**

1. A homogeneous uncured cementitious composition which comprises the ingredients:

(a) a hydraulic cement,

(b) water, and

(c) a water-dispersible polymer selected from those polymers which contain carboxyl groups and which have total carboxyl content equivalent to at least 50 mg KOH/g of polymer, and which have a pK_a in the range of 3–10;

and wherein:

(i) the ratio of water to hydraulic cement is in the range of 10–28 parts by weight of water to 100 parts of hydraulic cement:

(ii) the ratio of the water-dispersible polymer to hydraulic cement is in the range 0.1–10.0 parts by weight of water-dispersible polymer to 100 parts by weight of hydraulic cement; and

(iii) the water-dispersible polymer is further selected with reference to the hydraulic cement and to the selected proportions of water and hydraulic cement for its suitability to facilitate homogenisation and to yield on homogenisation a product which can be shaped under pressure and which product is shape retaining;

and wherein the ingredients (a), (b) and (c), have been jointly subjected to a homogenisation process and, optionally, are shaped such that on curing and drying, the homogeneous uncured composition yields a cured, dried and optionally shaped cementitious material having a modulus of rupture greater than 15 MN/m^2.

4,229,225

CEMENT-BASED POWDERED WATER-REPELLENT COMPOSITION, AND ITS APPLICATIONS

Richard Kraszewski, 31450, Odars, and Jean J. Damiguet, 66 Avenue Sainte Marie, 94160 Saint Mande, both of France

Filed Jul. 20, 1979, Ser. No. 59,155

Claims priority, application France, Aug. 3, 1978, 78 22961

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—99 **12 Claims**

1. Cement-based powdered water-repellent composition, comprising, expressed as dry weight:

(a) 20–60% of a cement,

(b) 30–70% of an inorganic or organic filler,

(c) 2–10% of a fibre selected from zirconium, hafnium, vanadium and cesium silicate fibres,

(d) 0.2–1% of plasticizers for cement,

(e) 1–3% of an adhesive,

(f) 0.1–0.5% of a water-repellent.

4,229,226

METHOD FOR THE PRODUCTION OF CEMENT CLINKER LOW IN SULPHUR

Andris Abelitis, Rösrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Wedag AG, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 974,610

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1977, 2759249

Int. Cl.[2] C04B *7/36*

U.S. Cl. 106—100 **4 Claims**

1. In a method for the production of cement clinker low in sulphur from a sulphur and calcium carbonate containing particulate raw material which involves sequentially preheating said material in a plurality of successive preheating stages of progressively increasing temperatures, sintering the preheated material in a sintering furnace to produce sulphur containing hot exhaust gases, and cooling the resulting sintered material in a cooler, the improvement which comprises:

separating a portion of said sulphur containing exhaust gases issuing from said sintering furnace,

passing the separated portion into the hottest zone of said preheating stages,

heating the raw material in contact with said separated portion to a temperature below the deacidification temperature in said hottest stage,

adding a reducing agent to the thus heated raw material,

sintering the thus treated raw material and reducing agent in said sintering furnace, and

removing the remaining portion of said sulphur-containing exhaust gases issuing from said sintering furnace from the system without passing the same into said preheating stages.

4,229,227

GEL COMPOSITION FOR NAIL ENAMEL

Toshihide Ikeda, Yokohama, and Motokiyo Nakano, Sagamihara, both of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,243

Int. Cl.[2] A61K *7/043;* C08L *1/18*

U.S. Cl. 106—181 **10 Claims**

1. A gel composition for a nail enamel comprising (i) 10 through 30% by weight of a chip composition which is prepared by mixing, under heat and compression, a mixture of (A) 25 through 70% by weight of an organically modified montmorillonite clay, (B) 5 through 70% by weight of nitrocellulose and (C) 5 through 30% by weight of at least one substance selected from the group consisting of compounds having a general formula, $HO(RO)_mH$ (wherein R is C_2H_4 and C_3H_6) and m is an integer of 3 through 90); compounds having a general formula $R'O(RO)_nH$ (wherein R is C_2H_4 and C_3H_6,R' is an alkyl group having 4 through 20 carbon atoms and n is an integer of 1 through 50) and esters of dicarboxylic acids having

4 through 10 carbon atoms with aliphatic lower alcohols having 1 through 4 carbon atoms, and; (ii) 70 through 90% by weight of an organic mixed solvent.

4,229,228

COATING COMPOSITION

Don H. Rotenberg, Westboro; Patricia M. Cuffe, Dudley; Bernard L. Laurin, Ludlow, and Peter R. Ramirez, Southbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 897,317, Apr. 18, 1978, Pat. No. 4,173,490. This application Oct. 4, 1978, Ser. No. 948,595

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.[3] C09K *3/00*

U.S. Cl. 106—287.14 3 Claims

1. A coating composition which is curable to provide an optically clear abrasion resistant coating, which comprises a hydrolysis product of about 35 to 45 weight percent tetraethyl orthosilicate and 55 to 45 weight percent methyltrimethoxysilane, and 5 to 15 weight percent 3-glycidoxypropyltrimethoxysilane.

4,229,229

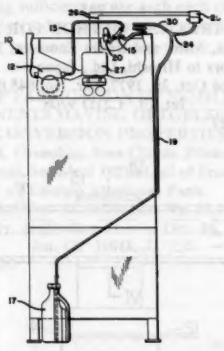
WAREWASHER SANITIZER VENTED METERING SYSTEM

George Churley, and Louis F. Fraula, both of Troy, Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed May 18, 1979, Ser. No. 40,256

Int. Cl.[3] B08B *7/04*

U.S. Cl. 134—18 7 Claims



6. A method for injecting a measured quantity of a liquid sanitizing agent into the sanitizing system of a warewasher such as a dishwashing machine having a sanitizing system for chemically sanitizing foodware items therein, including a dispenser which is operable for controllably delivering a liquid sanitizing agent from a supply thereof into the sanitizing system, comprising:

(a) filling a capillary conduit section of defined volume with a liquid sanitizing agent drawn upwardly from a supply thereof,

(b) then venting the upstream end of said capillary section to atmosphere to separate the agent in the capillary section from that in the supply and provide a liquid plug of defined volume which is delivered into the sanitizing system wherein said venting occurs after the sanitizing agent is delivered into the capillary section from said supply for a predetermined time which is just long enough to fill the capillary section regardless of atmospheric conditions.

4,229,230

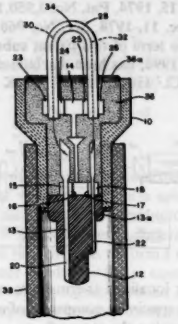
EXPENDABLE IMMERSION THERMOCOUPLE

Richard J. Hance, Philadelphia, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 19, 1978, Ser. No. 952,756

Int. Cl.[3] H01J *35/02*

U.S. Cl. 136—234 5 Claims



1. In the method of manufacture of an expendable immersion thermocouple having a thermocouple enveloped in a high temperature protective tube and secured in the face of a body member by a mass of refractory cement, the improvement comprising the step of forming within the exposed face of said refractory cement a zone of high temperature refractory material comprising alumina or magnesia.

4,229,231

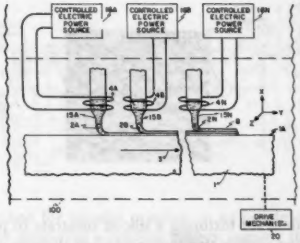
METHOD OF FORMING A LAMINATED RIBBON STRUCTURE

August F. Witt, Winchester, and Ramaswamy V. Raman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 13, 1978, Ser. No. 950,965

Int. Cl.[2] H01L *21/208*

U.S. Cl. 148—1.5 28 Claims



1. A method of forming a multi-layered solid structure by means of rapid quenching of separate melts, that comprises depositing a first melt in the form of a liquid stream from a first delivery orifice upon a fast moving heat extracting surface to effect quenching and solidification thereon and form a first solid layer in ribbon form; and simultaneously depositing a second melt in the form of a liquid stream from a second delivery orifice which is physically separated by a small distance from the first orifice in the direction of movement of the first solid layer upon said first solid layer to effect quenching of the second melt and form a second solid layer upon the first solid layer to provide a multi-layered solid structure.

4,229,232

METHOD INVOLVING PULSED BEAM PROCESSING OF METALLIC AND DIELECTRIC MATERIALS

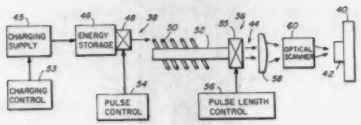
Allen R. Kirkpatrick, Lexington, Mass., assignor to Spire Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 780,416, Mar. 23, 1977, Pat. No. 4,151,008, which is a continuation-in-part of Ser. No. 636,055, Nov. 28, 1975, abandoned, which is a division of Ser. No. 524,062, Nov. 15, 1974, Pat. No. 3,950,187. This application Dec. 11, 1978, Ser. No. 968,379

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.[2] H01L *21/263;* B23K *27/00*

U.S. Cl. 148—1.5 2 Claims



1. A method for localized thermal processing of a selected surface region of a specimen composed of a metallic or dielectric material comprising the steps of:

(a) generating a short duration, noncoherent pulsed light;

(b) directing said short duration pulsed light at the selected surface region of the specimen, said short duration pulsed light beam interacting with said selected surface region; and

(c) momentariiy elevating temperature only in a vicinity of the selected region by impacting said short duration, noncoherent light pulse upon the selected surface region.

4,229,233

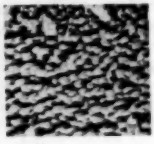
METHOD FOR FABRICATING NON-REFLECTIVE SEMICONDUCTOR SURFACES BY ANISOTROPIC REACTIVE ION ETCHING

Thomas A. Hansen, Poughkeepsie; Claude Johnson, Jr., Yorktown Heights, and Robert R. Wilbarg, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,005

Int. Cl.[3] H01L *21/22, 21/306*

U.S. Cl. 148—1.5 6 Claims



1. A method for texturing a silicon substrate to provide an anti-reflective surface thereon comprising the step of:

reactive ion etching the surface of said substrate, in the absence of an etch mask on said surface, in a reactive ion etching chamber which contains a chemically active gaseous species which combines with said silicon to form a volatile species such that said surface is subjected to both physical sputtering as well as a chemical reaction with the gaseous species,

said etching taking place for a sufficient time to texture said silicon surface.

6. A method as in claim 1 further comprising:

forming a P/N junction with in said substrate after said texturing step.

4,229,234

PASSIVATED, PARTICULATE HIGH CURIE TEMPERATURE MAGNETIC ALLOYS

Richard C. Krutenat, New Providence, and Chih-an Liu, Fords, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 29, 1978, Ser. No. 384

Int. Cl.[2] H01F *1/06*

U.S. Cl. 148—105 16 Claims

1. A process for the preparation of passivated, particulate high Curie temperature magnetic alloys which are useful per se or as inclusions for the preparation of magnetizable solids composites, catalytic or non-catalytic, which comprises alloying an element characterized as aluminum, silicon, chromium, or admixture thereof, in concentration ranging up to about 30 percent, based on the total weight of the alloy, with a base metal comprised of cobalt or nickel, forming particles of the alloy which range in average diameter from about 20 microns to about 1500 microns, and then contacting the alloy particles with an atmosphere of low oxygen activity, the oxygen partial pressure of which is lower than the dissociation pressure of an oxide formed from the base metal, sufficient to preferentially oxidize the alloying element and cause it to diffuse to the surface of the particles to form an impervious oxide film of thickness ranging from about 0.1 micron to about 5 microns.

4,229,235

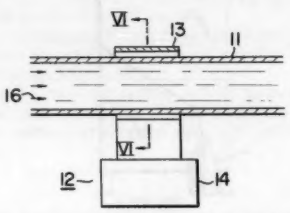
HEAT-TREATING METHOD FOR PIPES

Noriaki Matsuda, Mito, and Kunio Enomoto, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 25, 1977, Ser. No. 845,063

Int. Cl.[3] C21D *9/08*

U.S. Cl. 148—127 26 Claims



1. A method of heat-treating piping in situ within a plant comprising the steps of:

(a) supplying a liquid coolant to the piping after said piping is installed by plastic working or welding of portions of the piping in a plant, said plastic working or welding causing residual stresses that may lead to stress corrosion;

(b) heating the outer side of the plastic worked or welded portions of said piping while the liquid coolant is present in said piping to create a great temperature differential between said outer side of said piping and the inner side of said piping so that compressive yielding is produced in said outer side of said piping and tensile yielding is produced in said inner side of said piping; and then

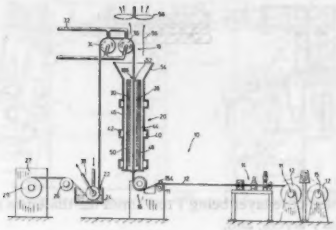
(c) stopping the heating of said piping whereby residual compressive stress is induced into said portions to reduce possible stress corrosion during subsequent operation of said plant.

4,229,236

PROCESS AND APPARATUS FOR HEAT TREATING STEEL USING INFRARED RADIATION

James E. Heath, Mississauga, Canada, assignor to Samuel Strapping Systems Limited, Mississauga, Canada

Filed Jul. 27, 1979, Ser. No. 61,471
Int. Cl.[2] C21D 1/54
U.S. Cl. 148—128 10 Claims



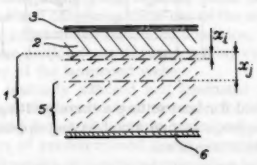
1. A furnace adapted for use in stress relieving a length of steel sheet, strip, strapping, wire and the like comprising opposing spaced-apart parallel banks of high intensity infrared radiation emitters having ceramic reflectors along said banks and located behind said emitters, each emitter being an elongate lamp having an electrode at each end, opposing spaced-apart suitable supports secured within said furnace and provided with aligned apertures to permit said lamp ends to extend through such apertures in supporting each lamp in a respective bank, each lamp electrode being external of a corresponding support, means defining a channel along the outside of each support and in which said lamp electrodes are disposed and fan means for forcing sufficient air through each channel to maintain said lamp electrodes at operating temperatures.

4,229,237

METHOD OF FABRICATION OF SEMICONDUCTOR COMPONENTS HAVING OPTOELECTRONIC CONVERSION PROPERTIES

Daniel Bensahel, Grenoble; Jean-Claude Pfister, Saint Ismier, and Louis Revoil, Seyssinet Pariset, all of France, assignors to Commissariat a l'Energie Atomique, Paris

Filed Oct. 18, 1979, Ser. No. 85,948
Claims priority, application France, Oct. 26, 1978, 78 30497
Int. Cl.[3] H01L 21/225
U.S. Cl. 148—190 14 Claims



1. A method of fabrication of a semiconductor component having optoelectronic conversion properties, wherein said method comprises the following steps:

(a) there is employed at the outset a wafer of p-type ZnTe semiconductor material;

(b) the top surface of said wafer is subjected to double diffusion of an acceptor impurity and of a donor impurity so as to create in ZnTe on the one hand a compensated region having high resistivity and on the other hand a surface injection region of small thickness; and

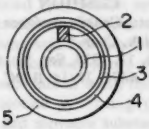
(c) a metallic contact is formed on both faces of said wafer.

4,229,238

PROCESS FOR MANUFACTURING COAXIAL CABLE

Yasunori Saito, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 9, 1978, Ser. No. 932,161
Claims priority, application Japan, Dec. 2, 1977, 52-145536
Int. Cl.[3] B29F 3/10
U.S. Cl. 156—50 1 Claim



1. In a process for manufacturing a coaxial cable core which includes the steps of winding a rib in a spiral fashion on the outer peripheral surface of an inner conductor along the length thereof, extruding a synthetic resin material onto the outer peripheral surface of said rib so as to form a tubular outer layer surrounding said inner conductor but in contact only with said rib, and cooling and solidifying said tubular outer layer so as to form an insulating layer, the improvement comprising the steps of:

(a) reheating said insulating layer until said insulating layer assumes a substantially uniform shape and recooling and resolidifying said reheated insulating layer;

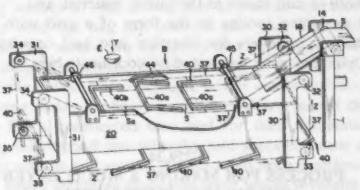
(b) reducing the outer diameter of said inner conductor by an amount in the range of 2% to 5% of the original outer diameter prior to the step of winding the rib.

4,229,239

TRANSFER PRINTING METHOD

Eisuke Arai, Koganei; Kuniaki Kamei, Kodaira; Akio Kawasaki, Urawa; Fumio Takagi; Koichi Shirai, both of Tokyo, and Yasuharu Orihara, Urawa, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 924,853
Claims priority, application Japan, Jul. 27, 1977, 52-90049; Aug. 17, 1977, 52-98482; Aug. 25, 1977, 52-102007; Jan. 24, 1978, 53-6317
Int. Cl.[2] B32B 31/12; B44C 1/16
U.S. Cl. 156—155 15 Claims



1. A method for transfer printing on an article comprising the steps of: preparing a printing pattern support sheet made-up of a film soluble in a liquid and a pattern preprinted on one surface of film; applying a solvent to said pattern thereby to activate the pattern into an adherent condition ready for printing; feeding the sheet towards a position for transfer printing on the free surface of a mass of said liquid, the film of the sheet thereby contacting and floating on the free surface; causing the film of the sheet to gradually dissolve in the liquid, while being fed toward said position, to leave the pattern on the free surface of the liquid; isolating the part of the sheet in said position from the other part of the sheet, which is being fed toward said position, by raising the sheet, by means of a bar located below the sheet, above the surface of the liquid between said parts; and moving the article against the pattern floating on the free

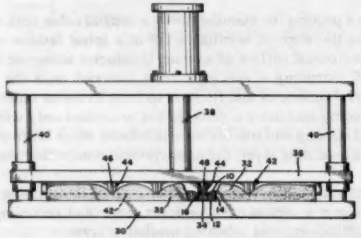
surface in said position and into the liquid to transfer the pattern onto the article.

4,229,240

METHOD OF MAKING SIMULATED TUFTED SEAT CUSHION

Olivio Borgiani, Toronto, Canada, assignor to Electrolux Corporation, Old Greenwich, Conn.

Filed Feb. 13, 1978, Ser. No. 877,216
Int. Cl.³ A47C *27/14;* B29C *17/04*
U.S. Cl. 156—214 **4 Claims**



1. An improvement in the method of making a simulated tufted cushion, which comprises:

(a) forming discrete spaced openings extending through a foam rubber pad;

(b) placing said pad on a lower sheet of plastic material, said sheet being disposed so as to have its entire upper surface in a single horizontal plane such that said extended openings remain available for filling;

(c) substantially filling said openings from said horizontal plane upwardly with discrete plugs of fusible material;

(d) placing an upper sheet of plastic material over said pad;

(e) applying pressure selectively to said upper sheet so as to draw the upper sheet down into the openings containing said plugs of material, thereby to give the appearance of tufts;

(f) heating selectively in at least said openings so as to fuse both of said sheets to the fusible material; and

(g) providing tooling in the form of a grid with spaced hollow cylinders for insertion into said openings, said cylinders being connected by coordinate bars.

4,229,241

PROCESS FOR MAKING A MULTI LAYER POLYOLEFIN SHRINK FILM

Walter B. Mueller, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 896,963, Apr. 17, 1978. This application Dec. 4, 1978, Ser. No. 966,437
Int. Cl.² B29D *7/09, 23/04*
U.S. Cl. 156—243 **5 Claims**

1. A process for making a multi-layer, flexible, thermoplastic packaging film comprising the steps of:

(a) blending 70% to 90% by weight of polymer selected from the group consisting of homopolymers and copolymers of ethylene with 30% to 10% by weight of a polymer selected from the group consisting of butylene homopolymers and copolymers to form a core blend;

(b) providing an auxiliary composition comprising a polymer selected from the group consisting of propylene homopolymers and copolymers;

(c) coextruding a layer of said core blend between two layers of said auxiliary composition to form a multi-layer

film, said core layer being 1 to 8 times the thickness of said auxiliary layers; and,

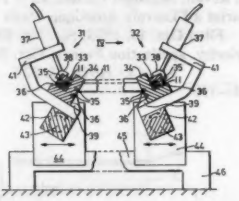
(d) stretching said multi-layer film to orient same.

4,229,242

METHOD AND APPARATUS FOR PRESSING AND CURING RESIN-IMPREGNATED WRAPPINGS ABOUT COILS

Malcolm Otty, Westering, Mill Hay Rd., Caldy, Merseyside, England

Filed May 31, 1978, Ser. No. 911,230
Claims priority, application United Kingdom, Jun. 1, 1977, 23879/77
Int. Cl.² B29C *27/00;* B32B *31/14*
U.S. Cl. 156—245 **13 Claims**



1. A method for heat setting a thermosetting resin impregnated in wrappings around a coil having opposed straight leg portions, which comprises:

adjusting as necessary the relative positions of two separate mold base members adapted to separately support said leg portions;

disposing said leg portions of said coil in said mold members;

placing a pair of mold cover members against said leg portions;

moving fluid actuated clamping means from a position in which the mold members are open for insertion of said core to a clamping position;

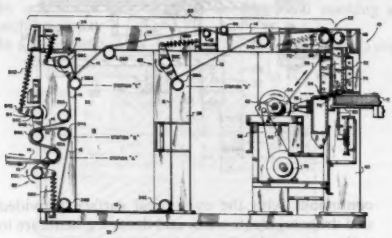
clamping said pair of mold cover members against said leg portions by said clamping means; and

applying heat and pressure to said coil, thereby bonding said wrappings of said coil around said straight leg portions.

4,229,243
RESILIENTLY STABILIZED WEB MOVEMENT FOR HONEYCOMB MACHINE

Daniel H. Ellinor, 6820 Briar Cove, Dallas, Tex. 75240

Filed Mar. 15, 1979, Ser. No. 20,759
Int. Cl.[2] B32B 31/00
U.S. Cl. 156—269 3 Claims



1. A method for manufacturing a continuous length of unexpanded honeycomb stock from first and second webs drawn from supply rolls comprising the steps:

guiding the webs in superimposed relation into a take-up zone;

applying tension to the superimposed webs at a first thrusting station by a first common dancer roller assembly which is biased to apply a yieldable thrusting force against the superimposed webs in the direction of unwinding movement of the webs as they are played out from the supply rolls;

applying tension to the superimposed webs at a second thrusting station by a second common dancer roller assembly which is biased to apply a relatively weaker yieldable thrusting force against the superimposed webs in the direction opposite to the direction of unwinding movement of the webs as they are played out from the supply rolls;

dividing the webs at a third station and guiding them along separate paths through the take-up zone;

applying a relatively weaker yieldable thrusting force against each separated web in the take-up zone at fourth and fifth thrusting stations, respectively, by third and fourth separate dancer roller assemblies, respectively, which are biased to apply a yieldable thrusting force against each respective separate web in a direction transverse to the movement of the web as it is engaged by the dancer roller;

applying stripes of adhesive to opposite sides of one of the webs as said web is advanced through the take-up zone;

pulling the webs along their separate paths through the take-up zone and delivering them out of the take-up zone in mutually adhered and laminated condition;

interrupting the pulling force during a cutting cycle following delivery of the laminated webs;

securing the mutually adhered and laminated end of the webs against displacement in response to the thrusting forces applied during the cutting cycle; and,

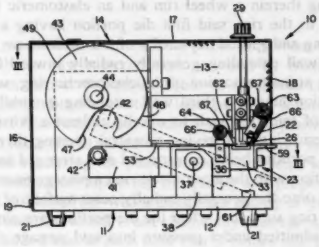
severing strips of predetermined width from the laminated webs and thrusting each severed strip into a pack of previously severed strips.

4,229,244
MANUAL BAG SEALER WITH LIFT BAR

Jack G. Swope, St. Ignace, Mich., assignor to Rennco Incorporated, Homer, Mich.

Filed Jul. 17, 1978, Ser. No. 925,434
Int. Cl.[2] B30B 15/34; B65B 51/14
U.S. Cl. 156—358 12 Claims

1. In a heat-sealing machine for sealing the open top of a manually-held preformed heat-sealable bag, said machine including a housing, a pair of jaws mounted on said housing adjacent the front vertical side thereof for permitting the open top of a bag to be manually inserted between said jaws, said jaws being disposed in opposed and relatively movable relationship toward and away from one another for permitting the open top of a preformed bag to be manually held therebetween, heater means associated with one of said jaws for creating a sealing strip across the bag adjacent the top thereof when the latter is held between the jaws, wherein said pair of jaws includes first and second jaws which are horizontally elongated and are positioned vertically one above the other, the improvement comprising said first jaw being disposed uppermost and being fixedly and stationarily connected relative to said housing, said heater means being fixedly associated with said first jaw, said second jaw being positioned vertically below said first jaw and movable substantially vertically between a lowered open position wherein the second jaw is spaced downwardly from the first jaw and a raised closed position wherein an upper clamping surface on said second jaw is substantially engaged with a lower clamping surface on said first jaw for permitting the open top portion of the bag to be clampingly held therebetween, support means movably mounting said second jaw on said housing for movement between said open and closed positions and for normally urging said second jaw into said open position, hand-engaging handle means fixed to said second jaw for permitting said second jaw to be manually moved upwardly from said open position into said closed position, said hand-engaging handle means being



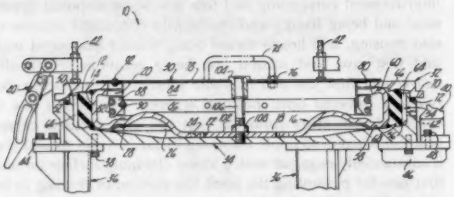
disposed closely adjacent and projecting forwardly from the clamping surface of said second jaw so that an operator can manually hold the bag top between the jaws and simultaneously lift the second jaw upwardly into said closed position, sensing means for sensing the positioning of said second jaw substantially in said closed position, power means activated by said sensing means for holding said second jaw in said closed position for a preselected time and for then automatically releasing said second jaw whereby said support means automatically returns said second jaw into said open position, said support means including elongated lever means pivotally supported on said housing for swinging movement about a substantially horizontal pivot axis which is spaced from and substantially parallel to the elongated direction of said second jaw, said second jaw being mounted on said lever means at a location spaced a substantial distance from said pivot axis, and said power means being engageable with said lever means at a predetermined location thereon which is spaced from said pivot axis when said jaw is in said closed position for both holding said jaw in said closed position for said predetermined time and applying a controlled clamping pressure between said jaws throughout said predetermined time, said power means including first means for gradually increasing the clamping pressure between said jaws during an initial portion of said predetermined time and second means for maintaining a constant clamping pressure between said jaws during the remainder of said predetermined time.

4,229,245

BONDING FIXTURE

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

Filed Nov. 13, 1978, Ser. No. 959,575
Int. Cl.[2] B29H *17/36*
U.S. Cl. 156—382 **11 Claims**



1. A fixture for bonding an elastomeric ring to a generally circular and rigid rim of a wheel comprising, first and second die portions relatively movable to open and closed positions and constructed and arranged to define when closed a cavity receiving therein a wheel rim and an elastomeric ring to be bonded to the rim, said first die portion having a first wall encircling and spaced outwardly of the elastomeric ring and a second wall extending generally radially inward thereof to underlie at least a portion of the elastomeric ring, said second die portion having a third wall extending generally radially inward of said first wall to overlie at least a portion of the elastomeric ring and having a central opening therethrough, said die portions being constructed and arranged to define in cooperation with the elastomeric ring a passage encircling and opening onto the generally radially outer surface of such elastomeric ring such that when the die portions are closed and a fluid is admitted under pressure into said passage the elastomeric ring is urged generally radially inward into firm engagement with the rim, and heater means having a cover constructed and arranged to overlie said central opening through said third wall and at least one heater element disposed generally radially inward of such rim and constructed and arranged to heat the rim to an elevated temperature to cure a bonding agent interposed between the elastomeric ring and the rim such that the elastomeric ring is adhered to the rim of the wheel.

4,229,246

BUILDING DRUM ASSEMBLY

Robert S. Vanderzee, Akron, Ohio, assignor to The Steelastic Company, Akron, Ohio

Filed Dec. 18, 1978, Ser. No. 970,570
Int. Cl.[3] B29H *17/22*
U.S. Cl. 156—417 **10 Claims**

1. In a tire building drum assembly having a longitudinal axis, a plurality of longitudinally oriented drum segments mounted to be selectively movable between a radially outwardly, expanded, position and a radially inwardly, collapsed, position, said drum segments presenting, in said collapsed position, a cylindrical surface for receiving tire carcass material;

a bead receiving area;

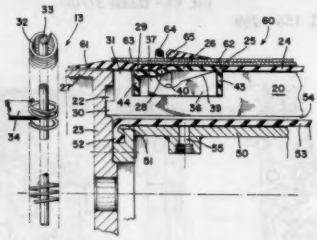
said bead receiving area comprising:

a cavity in each said drum segment forming an annular groove in said cylindrical surface;

a rigid bead receiving seat located in the cavity of at least selected drum segments and being secured to the drum segment in which it is received;

a flexible boot mounted on said drum segments;

said boot having a support portion overlying said bead receiving seat to present a surface that is substantially



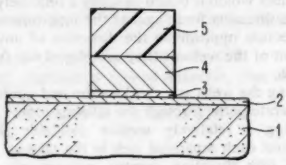
continuous with the cylindrical surface provided by said drum segments when said drum segments are in the collapsed position for receiving said tire carcass material.

4,229,247

GLOW DISCHARGE ETCHING PROCESS FOR CHROMIUM

George T. Chiu, Wappingers Falls; James R. Kitcher, Poughkeepsie; Gunars M. Ozols, Wappingers Falls, and Bryant N. Zingerman, Monroe, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,844
Int. Cl.[3] C23F *1/02*
U.S. Cl. 156—643 **16 Claims**



1. A process for selectively etching chromium comprising exposing chromium to a glow discharge in a low pressure ambient atmosphere comprising a mixture of from about 5 to 50 percent by volume of a polychlorinated organic compound and from about 50 to 95 percent by volume of a material selected from the group consisting of a noble gas and oxygen to which mixture is added from 5 to 30 percent by volume, based on said mixture, of water vapor.

10. A process for selectively etching chromium in the presence of a layer of material which is also exposed to the etching atmosphere comprising exposing the chromium to a glow discharge in an ambient atmosphere comprising from about 2 to 5 parts by volume of a polychlorinated organic compound, from about 5 to 8 parts by volume of a material selected from the group consisting of a noble gas and oxygen and from about 1 to 2 parts by volume of water vapor, the ambient atmosphere having a pressure of from about 5 to 50 milli-torr.

4,229,248

PROCESS FOR FORMING BONDING PADS ON MAGNETIC BUBBLE DEVICES

Peter J. Silverman, and Donald K. Rose, both of Palo Alto, Calif., assignors to Intel Magnetics, Inc., Santa Clara, Calif.

Filed Apr. 6, 1979, Ser. No. 27,669
Int. Cl.[3] B44C *1/22;* **B29C** *17/08;* **C03C** *15/00, 25/06*
U.S. Cl. 156—653 **10 Claims**

1. In a magnetic bubble device which includes a layer of magnetic material in which magnetic bubbles are moved and a

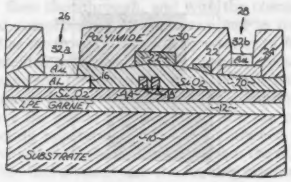
metal layer covered except for an exposed region by an overlying protective layer, a process for increasing the thickness of said exposed region comprising the steps of:

forming a layer of gold over said protective layer and over said exposed region;

washing said layer of gold from said protective layer but not from said exposed region;

whereby the thickness of said exposed region is augmented by a layer of gold without an additional masking and etching step.

5. In a magnetic bubble device which includes a first layer of



material in which magnetic bubbles are moved and a second layer disposed above said first layer, said second layer defining bonding pads, a process for preparing said device for probe testing or bonding comprising the steps of:

forming a protective layer over said second layer;

etching said protective layer to expose said bonding pads underlying said protective layer;

forming a gold layer on said protective layer and on said bonding pads;

washing said gold layer from said protective layer;

whereby gold remains on said bonding pads, thereby thickening them before probe testing or bonding.

4,229,249

PRODUCTION OF A POWDER OF POLYVINYLCHLORIDE OR A VINYLCHLORIDE COPOLYMERIZATE SUITABLE FOR PRODUCING PLASTISOLS

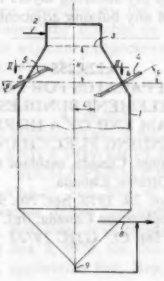
Karsten S. Felsvang, Allerod, and Ove E. Hansen, Vaerlose, both of Denmark, assignors to A/S Niro Atomizer, Denmark

Continuation of Ser. No. 792,609, May 2, 1977, abandoned. This application Mar. 22, 1979, Ser. No. 22,885

Claims priority, application Denmark, May 12, 1976, 2108/76

Int. Cl.[2] B01D *1/18*

U.S. Cl. 159—4 B **9 Claims**



1. A drying tower comprising a tower having a cylindrical part, means at one end thereof for providing a flow of drying air through the tower, at least one two-fluid nozzle for atomizing liquid into the tower by means of pressurised air in which the pressurised air is projected annularly with respect to the liquid, and at least one injector member for injecting air in a direction which, projected onto a plane at right angles to the longitudinal axis of the tower, forms an angle with a line through the centre of the tower and the outlet opening of the injector member, thereby providing within said drying tower a controlled rotary motion of the particles produced by the atomization and the flow of drying air.

4,229,250

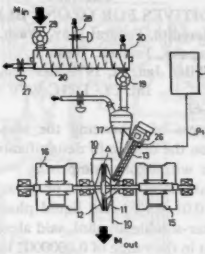
METHOD OF IMPROVING PROPERTIES OF MECHANICAL PAPER PULP WITHOUT CHEMICAL REACTION THEREWITH

Antti Lehtinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Feb. 28, 1979, Ser. No. 16,146

Int. Cl.[2] D21B *1/16*

U.S. Cl. 162—23 **10 Claims**



1. In the production of mechanical paper pulp from natural vegetable fibrous raw material such as wood by frictionally acting upon a natural vegetable fibrous raw material containing plasticizable constituents to at least partially separate the fibers thereof from each other while heating the plasticizable constituents thereof to a temperature sufficiently high to plasticize the same rendering the plasticizable constituents soft and sticky, the method of improving the quality and properties of pulp produced therefrom which comprises adding at least one paper filler material which is not chemically reactive with the pulp when added and at such time that it comes into contact with the plasticizable constituents of the pulp while the same are in softened and sticky condition so that the filler material adheres to but does not chemically react with the fibers of the pulp to result in improvement of the properties of the pulp.

4,229,251

HIGH-YIELD SEMI-CHEMICAL CARBONATE PULPING PROCESS

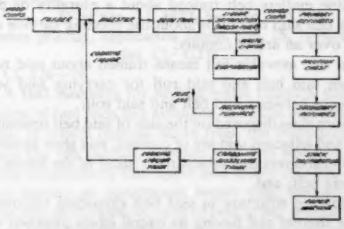
Jan S. Temler, Beaconsfield, Canada, assignor to Domtar, Inc., Montreal, Canada

Continuation-in-part of Ser. No. 545,796, Jan. 31, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,138

Claims priority, application Canada, Dec. 9, 1974, 215531

Int. Cl.[3] D21C *3/02, 11/12*

U.S. Cl. 162—28 **9 Claims**



1. A method of producing high-yield semi-chemical pulp

suitable for the manufacture of corrugating medium comprising mixing hardwood chips with a liquor consisting essentially of an aqueous solution of sodium carbonate having a concentration of carbonate between 65 and 120 grams per liter expressed as Na_2O, cooking the chips with said liquor at a temperature between 170° C. and 200° C. to a pulp yield of about 70–85%, separating the cooked chips from residual liquor and immediately thereafter passing said chips to a primary refining state, mechanically refining the cooked chips in said primary refining state to a pulp of a C.S.F. value not greater than 480, and mechanically refining said pulp in a secondary refining stage.

4,229,252

ADDITIVES FOR OZONE BLEACHING

Michael D. Meredith, Federal Way, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 11, 1979, Ser. No. 2,491
Int. Cl.[2] D21C *9/10*
U.S. Cl. 162—65 **14 Claims**

1. The process of enhancing the bleaching efficiency of ozone, based on the degree of delignification, when bleaching cellulosic fiber with ozone comprising

providing said fibers in a liquid phase at a consistency in the range of 0.01–4.9%, said liquid phase comprising water and a water-soluble alcohol, said alcohol being present in an amount in the range of 0.0000001 to 0.03 moles per liter of said liquid phase, and

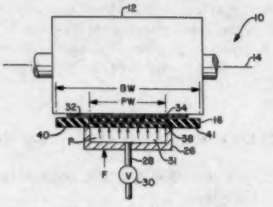
mixing an ozone-bearing gas with said liquid phase.

4,229,253

EXTENDED NIP PRESS WITH SPECIAL BELT REINFORCEMENT

Dennis C. Cronin, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 26, 1979, Ser. No. 33,707
Int. Cl.[3] D21F *3/02*
U.S. Cl. 162—358 **10 Claims**



1. An extended nip press for removing water from a moving web of material, said press comprising:

a rotatable roll having a cylindrical outer pressing surface;

a flexible endless belt trained about a plurality of pulleys such that said belt turns about the pressing surface of said roll over an arc of contact;

at least one movable felt means trained about said roll between said belt and said roll for carrying said web of material between said belt and said roll;

a pressure shoe disposed on the side of said belt opposite said roll and adjacent said arc of contact, said shoe terminating in lateral directions substantially short of the lateral edges of said belt; and

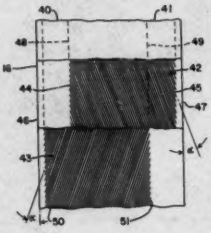
a reinforcing structure in said belt extending circumferentially thereof and having its lateral edges disposed within the lateral edges of said shoe so that said belt is substantially free of any bulging adjacent said shoe.

4,229,254

EXTENDED NIP PRESS WITH BIAS PLY REINFORCED BELT

Michael L. Gill, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 26, 1979, Ser. No. 33,709
Int. Cl.[3] D21F *3/02*
U.S. Cl. 162—358 **14 Claims**



1. An extended nip press for removing water from a moving web of material, said press comprising:

a rotatable roll having a cylindrical outer pressing surface;

a flexible endless belt trained about a plurality of pulleys such that said belt turns about the pressing surface of said roll over an arc of contact;

at least one movable felt means trained about said roll between said belt and said roll for carrying said web of material between said belt and said roll;

a pressure shoe disposed on the side of said belt opposite said roll and adjacent said arc of contact, said shoe terminating in lateral directions substantially short of the lateral edges of said belt; and

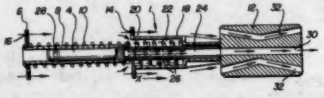
a reinforcing structure in said belt extending circumferentially thereof, said reinforcing structure comprising a first ply of parallel cord fabric having its cords extending at a first angle no greater than 25° with respect to the longitudinal direction and a second ply of parallel cord fabric having is cords extending at a second angle equal in magnitude but opposite in direction with respect to the longitudinal direction, said first ply and said second ply forming an overlapped portion which is limited in lateral directions substantially to the area of said shoe so that the portions of said belt laterally outside the area of said shoe are free of cross ply shearing layers and said belt is substantially free of any bulging adjacent said shoe.

4,229,255

METHOD AND APPARATUS FOR POSITIONING AND EJECTING FUEL ELEMENT BUNDLES IN AND FROM A DOWNSTREAM END OF A HORIZONTALLY EXTENDING FUEL CHANNEL

Peter Isaac, Mississauga, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jun. 20, 1978, Ser. No. 917,345
Claims priority, application Canada, Jul. 11, 1977, 282410
Int. Cl.[2] G21C *19/22*
U.S. Cl. 176—31 **6 Claims**



1. A nuclear fuel bundle assembly positioning and ejecting apparatus using pressurized coolant flow entrainment to eject

fuel bundles from a downstream end of a horizontally extending fuel channel, beyond the coolant flow therein, comprising:

(a) a first piston member slidable along the bore of the fuel channel,

(b) a stem integral with the first piston member and extending therefrom in a sliding direction thereof,

(c) a second piston member slidable along the bore of the fuel channel and slidably located on the stem,

(d) a compression spring between the first and second piston members for compression therebetween, and whereby,

(e) with the positioning and ejecting apparatus in a portion of the fuel channel which is upstream of pressurized coolant flow therethrough, and with the compression spring held compressed at the upstream end by the fuel channel and at the downstream end by a series of fuel bundles, in a shielded portion of the fuel channel, opening the downstream end of the fuel channel with a fuelling machine connected thereto will cause the compression spring to move the piston members apart and the positioning and ejecting apparatus will become entrained in the coolant flow and eject the fuel bundles from the downstream end of the fuel channel into the fuelling machine.

4,229,256

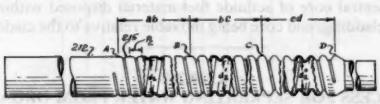
CORRUGATED THIMBLE TUBE FOR CONTROLLING CONTROL ROD DESCENT IN NUCLEAR REACTOR

Howard J. Luetzow, Dearborn, Mich., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1977, Ser. No. 865,145

Int. Cl.[2] G21C *7/16*

U.S. Cl. 176—36 S **2 Claims**



1. In a shock absorber for a control rod used in a nuclear reactor cooled by liquid, the improvement comprising a guide or thimble tube for said control rod, said thimble tube being internally helically corrugated along at least one extended axial portion near its lower end, said helically corrugated portion having internal diameters of smaller distance at the lower end than at the upper end of said corrugated portion and a progressively smaller pitch of corrugation from the top to the bottom of said corrugated portion and cooperating with the outer wall portion of the lower end of said control rod to brake the descent of said control rod with progressively increasing hydraulic restraining force provided by the liquid coolant in the annular space between the thimble or guide tube and said control rod as each adjacent progressively smaller section of corrugation is encountered.

4,229,257

METHOD OF OPERATING A NUCLEAR POWER INSTALLATION AND A POWER PLANT ADAPTED FOR SUCH OPERATION

Siegfried Förster, Alsdorf, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,316

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724812

Int. Cl.[2] G21C *15/22*; F01K *23/04*

U.S. Cl. 176—60 **11 Claims**

1. A method of operating a nuclear plant which comprises the steps of:

(a) heating a primary working gas in a high temperature nuclear reactor;

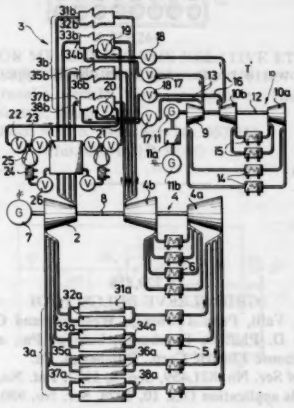
(b) driving at least one primary turbine set with the primary gas heated in step (a) by passing the heated primary gas through a turbine and displacing at least one compressor of said set connected to said turbine, and driving an electrical generator of said set to generate electric power thereby expanding said primary gas;

(c) abstracting heat from said primary gas subsequent to step (b) by recuperative heat exchange;

(d) compressing the primary gas from which heat is abstracted in step (c);

(e) heating the compressed primary gas of step (d) by said recuperative heat exchange and introducing the recuperatively heated primary gas into said nuclear reactor for further heating therein in step (a);

(f) upon the development of an increased electrical power



demand, heating a secondary gas by said recuperative heat exchange from a portion of the expanded primary gas of step (b);

(g) driving an auxiliary turbine set and electric power generator with the secondary gas heated by recuperative heat exchange in step (f) and

(h) compressing the secondary gas subsequent to step (g) and recirculating the compressed secondary gas to recuperative heating in step (f), the secondary gas being circulated along a path excluding said reactor through steps (f), (g) and (h) while being heated exclusively by said portion of the primary gas recirculated through steps (a), (b), (c), (d) and (e).

4,229,258

FUEL ASSEMBLY

Renzo Takeda, Yokohama; Sadao Uchikawa, Kawasaki; Kunitoshi Kurihara, Sagamihara; Masaaki Yamamoto, Kokubunji; Michiro Yokomi, Ibaraki; Junichi Yamashita, and Jun Takamatsu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 23, 1977, Ser. No. 835,962

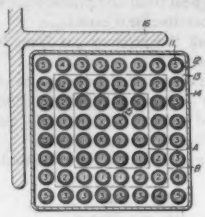
Claims priority, application Japan, Sep. 25, 1976, 51/115269

Int. Cl.[2] G21C *3/02*

U.S. Cl. 176—76 **31 Claims**

1. A fuel assembly for boiling-water reactors comprising a plurality of fuel rods and arranged in a core of a boiling-water reactor in which coolant flows from the bottom of the core toward the top thereof, wherein said fuel assembly is axially divided substantially into upper and lower regions, said upper region having an enrichment larger than that of the lower region, the enrichment in each of said upper and lower regions being uniformly distributed axially thereof and wherein the boundary between said upper and lower regions is located

such that when the fuel assembly is arranged in the core of the boiling-water reactor and the reactor has started its operation,



a peak power is produced in each of said upper and lower regions.

4,229,259

GRID SLEEVE BULGE TOOL

Ronald E. Vaill, Penn Township, Westmoreland County, and William D. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 831,459, Sep. 8, 1977, Pat. No. 4,182,152. This application Oct. 10, 1978, Ser. No. 950,206

Int. Cl.[2] G21C *21/08*

U.S. Cl. 176—78 **3 Claims**

1. The method of securing a nuclear reactor fuel assembly grid to control rod guide tubes extending therethrough comprising the steps of:

immovably fixing a short sleeve in selected cells in said grid;

pulling a control rod guide through each of said sleeves;

inserting a bulge tool in said guide tube, the end of said tool being positioned near the end of said sleeve on one side of said grid;

said tool including a housing having flexible tines thereon and outwardly extending projections on certain of said tines;

pulling a ram having surfaces complementary to the inner surfaces of said tines, into said housing;

causing said projections to move radially outward into contact with the inner surface of the guide tube;

continuing the pulling of said ram and causing said projections to create an outward bulge in said guide tube; and

moving said bulge tool in the guide tube to a position on the other side of said grid, and repeating the above process of creating a bulge in the guide tube to thereby mechanically secure said grid to the control rod guide tubes.

4,229,260

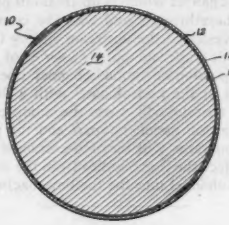
NUCLEAR REACTOR FUEL ELEMENT

Carl E. Johnson, Elk Grove, Ill., and Carl E. Crouthamel, Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 499,958, Aug. 23, 1974, abandoned. This application Jun. 2, 1976, Ser. No. 692,161

Int. Cl.[2] G21C *3/20*

U.S. Cl. 176—82 **7 Claims**



1. A nuclear reactor fuel element comprising:

a tubular-shaped outer metallic cladding having an inner surface and sealed ends;

a layer of chromium bonded to the inner surface of the cladding to form an integral member, said chromium acting as an oxygen getter to protect the cladding from corrosion;

a central core of actinide fuel material disposed within the cladding, said core being movable relative to the cladding.

4,229,261

PROCESS FOR SEPARATING WATER FROM ORGANIC MULTIPLE COMPONENT MIXTURES BY DISTILLATION

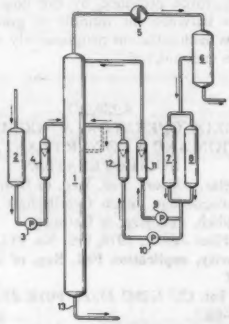
Günter Heck, Hofheim; Günter Roscher, and Rudolf Donth, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 487,741, Jul. 11, 1974, abandoned. This application Dec. 21, 1978, Ser. No. 971,900

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1973, 2335673

Int. Cl.[2] B01D *3/36*; C07B *51/42*

U.S. Cl. 203—14 **4 Claims**



1. A distillation process for the removal of water from organic multiple component mixtures containing water and consisting essentially of carboxylic acids having less than 5 carbon atoms and esters thereof, at least one of said organic components being partly miscible with water and being an azeotrope forming agent, comprising the steps of: introducing said or-

ganic multiple component mixture containing water into an inlet of a distillation column, azeotropically distilling overhead the water and the partly miscible azeotrope forming agent in said distillation column; condensing the resultant azeotropic distillate and separating the condensate into a water layer which is removed and an azeotrope forming agent layer; separating substantially all of the azeotrope forming agent layer into two parts and recycling one part to the top of the distillation column and the other part to the column at a point at or below the mixture inlet; and removing said organic multiple component mixture, free or almost free of water as a bottoms product.

4,229,262

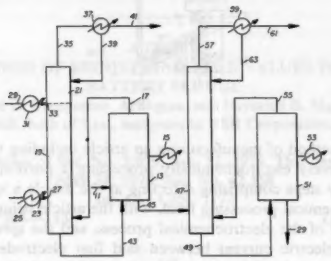
PROCESS FOR SEPARATING ALKOXYKETONE COMPOUNDS FROM THE CORRESPONDING 1-ALKOXY-2-ALKANOL COMPOUND

Denvil E. Reed, and Richard C. Grimm, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 822,197, Aug. 5, 1977, Pat. No. 4,153,516. This application May 4, 1979, Ser. No. 36,237

Int. Cl.[2] B01D *3/40;* **C07C** *49/24*

U.S. Cl. 203—29 **7 Claims**



1. A process for separating an alkoxyketone compound from a feed mixture of the alkoxyketone compound and the corresponding 1-alkoxy-2-alkanol compound which comprises:

A. introducing an extractant solvent selected from the group of aliphatic diols, triols and polyols having from two to six carbon atoms into an extractive distillation zone;

B. introducing said feed mixture into said extractive distillation zone at a point above the bottom thereof and below the point of entry of said extractant solvent, wherein said feed mixture contains an organic or inorganic base in an amount sufficient to raise the pH to 8 or greater;

C. subjecting the resulting mixture to extractive distillation in said extractive distillation zone; and

D. recovering at the top of said extractive distillation zone a distillate fraction containing alkoxyketon compound and said extractant solvent substantially free of the corresponding 1-alkoxy-2-alkanol compound.

4,229,263

RECOVERY OF METHYL HEPTAFLUOROBUTYRATE FROM METHANOL BY DISTILLATION

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 867,078, Jan. 5, 1978, Pat. No. 4,156,791, which is a continuation of Ser. No. 695,217, Jun. 11, 1976, abandoned. This application Dec. 21, 1978, Ser. No. 972,087

Int. Cl.[2] B01D *3/36;* **C07C** *69/62*

U.S. Cl. 203—44 **5 Claims**

4. A process of separating an admixture comprising methanol and methyl heptafluorobutyrate which comprises the steps of:

(a) distilling a mixture comprising methanol and methyl heptafluorobutyrate to produce an overhead methanol/-methyl heptafluorobutyrate azeotrope,

(b) condensing said overhead,

(c) adding water to the condensed overhead, thereby effecting a phase separation into a predominantly aqueous methanol liquid phase and a predominantly ester-containing liquid phase,

(d) separating said phases,

(e) returning the predominantly ester-containing liquid phase to said distillation step until the methanol content in said admixture is substantially exhausted,

thereby obtaining a substantially pure methyl heptafluorobutyrate.

4,229,264

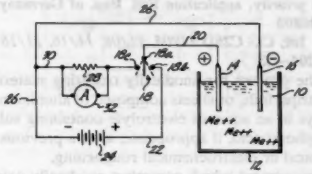
METHOD FOR MEASURING THE RELATIVE ETCHING OR STRIPPING RATE OF A SOLUTION

Donald R. Graunke, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 6, 1978, Ser. No. 957,742

Int. Cl.[2] B01D *59/40*

U.S. Cl. 204—1 T **6 Claims**



1. A method for providing an indication of the relative etching rate of a partially depleted oxidizing metal processing solution, said solution being partially depleted as a result of spontaneously oxidizing a metal to a dissolved metal ionic species, comprising the steps of:

(a) immersing in said solution first and second spaced electrodes each composed of a metal relatively inert with respect to said solution;

(b) applying a predetermined potential for a predetermined time across said electrodes to create a direct current through said solution between said electrodes to plate a determinable quantity of said metal ionic species as a metal plating on one of said electrodes;

(c) thereafter allowing said solution to oxidize said metal plating back to said ionic species without applying a potential to said electrodes; and

(d) measuring the elapsed time required for substantially all of said metal plating on said one electrode to be oxidized back to said ionic species.

4,229,265

METHOD FOR FABRICATING AND THE SOLID METAL ORIFICE PLATE FOR A JET DROP RECORDER PRODUCED THEREBY

E. J. Doyle Kenworthy, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 861,852, Dec. 19, 1977, Pat. No. 4,184,925. This application Aug. 9, 1979, Ser. No. 65,035

Int. Cl.[3] C25D *1/08, 1/02*

U.S. Cl. 204—11 **8 Claims**

1. A method for producing a solid orifice plate adapted for use in a jet drop recorder, comprising:

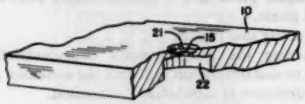
(a) forming a resist peg on a substrate to define an orifice recess,

(b) plating the substrate around the sides of the peg to form the orifice recess and over the peg to form an orifice smaller than the recess over the peg,

(c) using the orifice as a mask to form a resist plug larger

than the orifice over the orifice to define a cavity on the side of the orifice opposite the recess,

(d) plating the substrate again around the sides of the plug to thicken the orifice plate and to form the cavity, and



(e) removing the resist to leave an orifice plate having an orifice disposed between the recess and the cavity.

4,229,266

PROCESS FOR ANODICALLY OXIDIZING ALUMINUM AND USE OF THE MATERIAL SO PREPARED AS A PRINTING PLATE SUPPORT

Gerhard Usbeck, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 17, 1979, Ser. No. 67,391

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836803

Int. Cl.[2] C25D *11/04, 11/08, 11/16, 11/18*

U.S. Cl. 204—33 **5 Claims**

1. In the process for anodically oxidizing materials in the form of strips, foils, or sheets composed of aluminum or aluminum alloys in an aqueous electrolyte containing sulfuric acid and phosphoric acid, if appropriate, after a previous mechanical, chemical or electrochemical roughening,

the improvement which comprises anodically oxidizing the material in an electrolyte having a concentration of sulfuric acid ranging from about 25 to 150 g per liter, of phosphoric acid ranging from about 10 to 50 g per liter, and of aluminum ions ranging from about 5 to 25 g per liter, at a current density ranging from about 4 to 25 A/dm^2, and a temperature ranging from about 25° to 65° C.

4,229,267

ALKALINE BRIGHT ZINC PLATING AND ADDITIVE THEREFOR

Carl Steinecker, Milford, Mich., assignor to Richardson Chemical Company, Des Plaines, Ill.

Filed Jun. 1, 1979, Ser. No. 44,683

Int. Cl.[2] C25D *3/22, 3/24*

U.S. Cl. 204—55 R **23 Claims**

1. A bright zinc electroplating bath comprising an aqueous alkaline solution which includes a source of zinc ions and a bath soluble polymer containing repeating tertiaryaminoalkyl acrylamide groups or a quaternary salt thereof.

4,229,268

ACID ZINC PLATING BATHS AND METHODS FOR ELECTRODEPOSITING BRIGHT ZINC DEPOSITS

Richard K. Lowery, Garfield Heights, and Thomas W. Starinshak, Berea, both of Ohio, assignors to Rohco, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 972,739, Dec. 26, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,803

Int. Cl.[3] C25D *3/22*

U.S. Cl. 204—55 R **16 Claims**

1. An aqueous acidic plating bath substantially free of ammonium ions for the electrodeposition of a zinc coating on a substrate which comprises zinc ions, and an amount, sufficient to provide a level and bright zinc electrodeposit, of a polymeric sulfur-containing compound having the general formula

$$RS(R'O)_nH, \text{ or} \quad (I)$$

$$S[(R'O)_nH]_2 \quad (II)$$

wherein R is an alkyl group containing up to about 24 carbon atoms, each R' independently is an alkylene group or mixture of alkylene groups containing 2 or 3 carbon atoms and each n is independently an integer of from 1 to about 100.

4,229,269

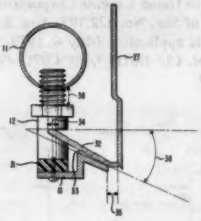
SPRAY CELL FOR SELECTIVE METAL DEPOSITION OR REMOVAL

Reginald R. Buckley, Summit, and Paul A. Kohl, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 1, 1979, Ser. No. 80,401

Int. Cl.[2] C25C *1/20, 7/00*

U.S. Cl. 204—109 **4 Claims**



1. A method of manufacturing an article including the step of selectively electrochemically processing a portion of the article by steps comprising directing at the article a spray of electrochemical processing fluid, with the article being a first electrode of the electrochemical process, and the spray conducting electric current between said first electrode and a second electrode of the electrochemical process, the invention CHARACTERIZED in that said spray comprises two or more fan-shaped spray portions produced by two or more spray nozzles, with said spray having a Reynold's number of at least 10,000, and further characterized in that said second electrode comprises one or more deflectors that intersect said spray at an included angle less than 45 degrees and thereby deflect the spray onto the portion of the article to be selectively processed, with the deflectors extending to a point closer than 10 millimeters from the portion of the article to be selectively processed.

4,229,270

PROCESS FOR THE RECOVERY OF METAL VALUES FROM ANODE SLIMES

Kohur N. Subramanian, East Hanover, N.J.; Malcolm C. E. Bell, Oakville, Canada; John A. Thomas, Norval, Canada, and Norman C. Nissen, Oakville, Canada, assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Apr. 2, 1979, Ser. No. 26,302

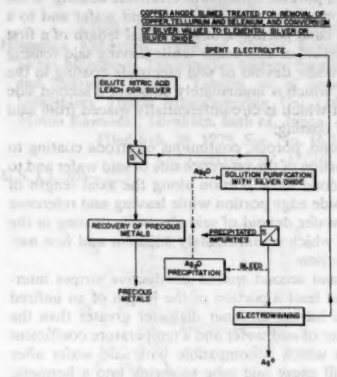
Claims priority, application United Kingdom, Apr. 12, 1978, 14345/78; Apr. 12, 1978, 14346/78; Apr. 12, 1978, 14347/78; Apr. 12, 1978, 14348/78

Int. Cl.[2] C25C *1/00*

U.S. Cl. 204—109 **18 Claims**

1. In a process for treating anode slimes which contain silver values and at least one of the metal values selenium and tellurium, and which may contain copper, nickel, precious metals and gold values, in which silver is recovered by electrowinning from an aqueous silver nitrate-containing solution, the improvement comprising converting silver values comprising silver compounds of selenium and/or tellurium to a material

containing silver in a form readily leachable in dilute nitric acid, leaching such silver-containing material with dilute nitric


COPPER ANODE SLIMES TREATED FOR REMOVAL OF COPPER, TELLURIUM AND SELENIUM, AND CONVERSION OF SILVER VALUES TO ELEMENTAL SILVER OR SILVER OXIDE
SPENT ELECTROLYTE
DILUTE NITRIC ACID LEACH FOR SILVER
SOLUTION PURIFICATION WITH SILVER OXIDE
RECOVERY OF PRECIOUS METALS
PRECIPITATED IMPURITIES
PRECIPITATION
PRECIOUS METALS
ELECTROWINNING

acid, and recovering silver from such leach solution by electrowinning.

4,229,271

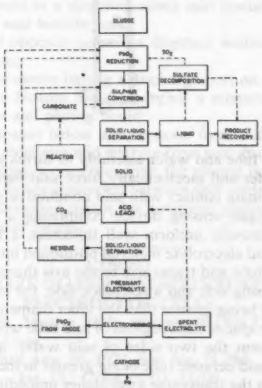
METHOD OF RECOVERING LEAD VALUES FROM BATTERY SLUDGE

Raymond D. Prengaman, Arlington, and Herschel B. McDonald, Red Oak, both of Tex., assignors to RSR Corporation, Dallas, Tex.

Continuation of Ser. No. 3,079, Jan. 12, 1979. This application May 24, 1979, Ser. No. 42,158

Int. Cl.[2] C25C *1/18*

U.S. Cl. 204—114 **11 Claims**



1. A method for recovering substantially all lead values from battery sludge as metallic lead, which comprises:

(a) subjecting the sludge to low temperature reducing conditions;

(b) treating an aqueous solution of the sludge with a compound selected from the group comprising salts and bases which form soluble sulfur-containing materials while converting lead sulfate to insoluble non-sulfur containing compounds;

(c) separating the resultant solid product by solid-liquid separation techniques;

(d) leaching the solid product from step (c) with an aqueous solution of an acid suitable for use in an electrolytic cell;

(e) separating the supernatant resulting from step (d) from the solid residue; and

(f) electrowinning the lead from the separated supernatant.

4,229,272

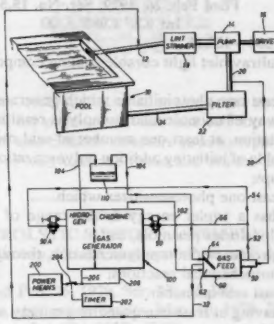
CHLORINE GENERATOR AND METHOD

Dow Yates, Loop 336, Villa Torres, Apt. #75D, Conroe, Tex. 77301

Filed Mar. 30, 1979, Ser. No. 25,291

Int. Cl.[3] C25B *1/00, 1/02, 15/08;* C02F *1/76*

U.S. Cl. 204—128 **22 Claims**



1. In a method of injecting chlorine into a desired stream of water, the steps of:

(a) simultaneously, electrolytically generating chlorine gas and hydrogen gas within an electrolytic cell comprising an anode and a cathode immersed in an aqueous electrolytic solution;

(b) collecting the chlorine and hydrogen gas in respective separate regions in the electrolytic cell above the electrolytic solution;

(c) in response to the naturally occuring pressure developed by the generation and collection of gases in Steps (a) and (b); separately conveying the chlorine and hydrogen gases essentially free of electrolytic solution through two individual conduits to a gas feed system including an enclosed housing and an interior chamber into which the gases are directly conveyed by said two conduits;

(d) flowing at least a portion of said desired stream of water into the enclosed housing of the gas feed system and into the interior chamber; and then

(e) flowing the water, chlorine and hydrogen from said interior chamber to the desired stream of water.

4,229,273

METHOD FOR PREPARING SILICONE GRAFT COPOLYMERS

Georges H. Wajs, Ivry, France, assignor to Essilor International Compagnie Generale d'Optique, Joinville le Pont, France

Continuation of Ser. No. 889,640, Mar. 24, 1978, abandoned. This application May 23, 1979, Ser. No. 41,734

Claims priority, application France, Mar. 31, 1977, 77 09766

Int. Cl.[3] C08L *51/08;* C08F *2/46;* B29D *11/00*

U.S. Cl. 204—159.13 **14 Claims**

1. A method for preparing graft polyorganosiloxanes comprising an irradiating step, wherein an article previously moulded from a polyorgaosiloxane is subjected to a non ionizing UV radiation having a wave-length within the range from 1800 to 4000 Angtröms in the presence of oxygen, the article being exposed to a power intensity of said radiation of about 100 to 1000 mw/cm^2 for a time period of about 5 seconds to 30

minutes and a subsequent grafting step wherein said article is contacted with a monomer selected from compounds having a pyrrolidone ring wherein the nitrogen atom of the heterocyclic ring carries as a substituent a hydrocarbon radical including an ethylenically unsaturated group, whereby said monomer is grafted onto the polyorganosiloxane.

4,229,274

ULTRAVIOLET LIGHT CURABLE COMPOSITIONS FOR PRODUCING COATINGS OF LOW GLOSS

Leland H. Carlblom, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 26, 1979, Ser. No. 15,544
Int. Cl.[2] C08F 8/00
U.S. Cl. 204—159.15 **18 Claims**

1. An ultraviolet light curable coating composition comprising:

a. at least one photoinitiator which generates a radical pair by way of unimolecular homolysis resulting from photoexcitation, at least one member of said radical pair being capable of initiating addition polymerization of acrylyloxy groups;

b. at least one photosensitizer which

(1) has a triplet energy in the range of from 54 to 72 kilocalories per mole, and

(2) promotes photopolymerization through bimolecular photochemical reactions;

c. at least one quencher

(1) having at least one quenching moiety which quenches said photosensitizer to an extent greater than the extent to which said photosensitizer is quenched by acrylyloxy groups,

(2) which is not itself either an effective initiator or an effective inhibitor of free radical polymerization of acrylyloxy groups,

(3) which does not produce products during quenching of said photosensitizer which are either effective initiators or effective inhibitors of free radical polymerization of acrylyloxy groups,

(4) which either does not quench said photoinitiator or quenches said photoinitiator at a rate much less than the rate at which said photoinitiator induces polymerization of acrylyloxy groups so as not to significantly interfere with the initiation of free radical polymerization of acrylyloxy groups by said member of said radical pair, and

(5) which has at least one of the following characteristics:

(i) a triplet energy in the range of from 35 to 68 kilocalories per mole, but lower than the triplet energy of said photosensitizer,

(ii) an ionization potential in the range of from about 6½ to 9 electron volts,

(iii) an ionization potential in the range of from 10½ to about 12 electron volts; and

d. at least one compound having a plurality of acrylyloxy groups and capable of being free radically addition polymerized by interaction with said photoinitiator and said photosensitizer; wherein upon exposure to ultraviolet light, a coating of said coating composition is cured to a crosslinked film having a lower gloss than if said quencher were absent.

4,229,275

SOLID ELECTROLYTE OXYGEN SENSOR AND METHOD OF MAKING SAME

Edward P. Habdas, and Jon D. Aaron, both of Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 9, 1979, Ser. No. 55,573
Int. Cl.[2] G01N 27/58; C04B 37/00
U.S. Cl. 204—195 S **8 Claims**

1. A method of making an oxygen sensing device comprising the steps of:

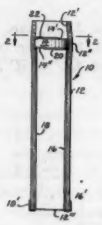
forming a sintered wafer of stabilized solid electrolyte ceramic;

applying a first, porous, continuous electrode coating to the major portion of the sensing side of said wafer and to a narrow first band portion along the axial length of a first side edge portion of said wafer while leaving said sensing side of said wafer devoid of said electrode coating in the area thereof which is immediately adjacent a second side edge portion which is circumferentially spaced from said first band of coating;

applying a second, porous, continuous electrode coating to the major portion of the reference side of said wafer and to a narrow second band portion along the axial length of said second side edge portion while leaving said reference side of said wafer devoid of said electrode coating in the area thereof which is immediately adjacent said first narrow band portion;

applying first and second spaced conductive stripes internally along at least a portion of the length of an unfired ceramic tube having an inner diameter greater than the outer diameter of said wafer and a temperature coefficient of expansion which is compatible with said wafer after firing but will cause said tube to shrink into a hermetic sealing relationship with said wafer during firing, said stripes being applied at a circumferential spacing corresponding to the spacing between said first and second bands of coating;

positioning said wafer internally of said unfired ceramic tube so that its first and second bands of coating are aligned with and overlie said first and second conductive stripes; and



firing said tube and wafer assembly to shrink said tube onto said wafer and mechanically force said bands of coating into intimate contact with said conductive stripes.

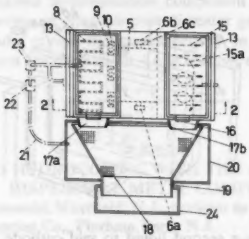
6. An oxygen sensing device comprising a ceramic tube having a relatively uniform wall thickness; a thin wafer of stabilized solid electrolyte material positioned intermediate the ends of said tube and transverse to the axis thereof, said wafer having a sensing side and a reference side, the outer diameter of said wafer being greater than the inner diameter of said tube in at least the spaced axial regions of said tube which are immediately adjacent the two sides of said wafer, and the outer diameter of said ceramic tube being greater in the plane of said wafer than in the transverse axial planes immediately adjacent thereto, said difference in diameters being sufficient to hermetically seal said wafer into said ceramic tube throughout a temperature range of at least about 500°–2000° F.; a first, continuous, porous electrode coating on the major portion of the sensing side of said wafer and along a first narrow band on the side edge of said wafer; a second, continuous porous electrode coating on the major portion of the reference side of said wafer and along a second, narrow band on the side edge of said wafer which is spaced circumferentially around said wafer from said first coating band, said sensing and reference sides being devoid of coating in the regions thereof which are immediately adjacent said second and first coating bands, respectively; first and second, axially extending, spaced conductive stripes positioned along the interior of said ceramic tube from the reference end thereof to at least the sensing edge of said wafer, said first and second conductive stripes being aligned with, and in

intimate electrical and mechanical contact with said first and second coating bands, respectively.

4,229,276
VIBRATORY PLATING APPARATUS

Hisamine Kobayashi, Nagoya; Motoo Kawasaki, Hirakata; Shozo Mizumoto, Takarazuka; Hidemi Nawafune, Takatsuki, and Sadamasa Suzuki, Tatsuta, all of Japan, assignors to Shikishima Tipton Manufacturing Co. Ltd., Nagoya and Motoo Kawasaki, Hirakata, both of, Japan

Filed Feb. 28, 1979, Ser. No. 16,144
Int. Cl.[2] C25D *17/02, 17/26*
U.S. Cl. 204—222 **8 Claims**



1. An apparatus for plating workpieces in a plating container, which comprises:

a base;

a vibratory plating container means resiliently mounted on said base for vibratory movement, said container means having a lid covering the top and having a bottom with a concavely arcuate cross-section;

a vibration-generating motor connected with said container means for causing vibration of said container means; for causing workpieces in said container means to roll and to be transferred in a direction along said container means parallel to said bottom; and

electrodes of opposite polarities disposed within said container means;

said container means having a discharge port on one side of the arcuate bottom for discharging a mixture of plated workpieces and plating liquid;

a screening means below and separate from said container means for receiving said mixture from said discharge port and separating workpieces from the plating liquid; and

liquid return means connected between said container means and said screening means for returning plating liquid to said container means.

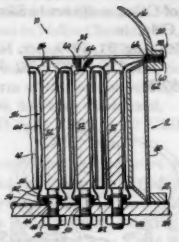
4,229,277
GLOVE-LIKE DIAPHRAGM STRUCTURE FOR ELECTROLYTIC CELLS

Steven J. Specht, Mentor, Ohio, assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 30, 1979, Ser. No. 71,204
Int. Cl.[3] C25B *13/02, 13/08*
U.S. Cl. 204—252 **20 Claims**

1. A non-adherent, glove-like diaphragm structure for use in an electrolysis cell of the type having an anolyte, a catholyte, a grate-like cathode structure with a plurality of vertical openings and an upper edge, a cell base supporting said cathode structure from below, a plurality of vertical anode risers attached to said cell base, a plurality of anodes attached to said anode risers and passing upwardly into openings in said cathode structure and a cell top for closing the top of the cell, said diaphragm structure comprising the following parts:

(a) a plurality of interconnected finger means, having an open upper end, a closed lower end and a middle section connecting said upper and lower ends, for passing over and downwardly through said grate-like cathode structure and loosely around and under said anodes so as to separate said anodes from said cathode structure, said finger means having portions defining at least one opening in the lower end thereof through which said anode risers can sealingly pass; and

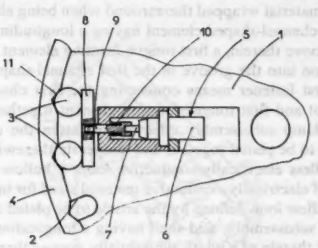


(b) border means, sealingly attached to said upper end of said finger means, for passing between said cell top and said upper edge of said cathode structure so as to separate said upper edge of said cathode from said anodes and said anolyte.

4,229,278
ELECTROLYTIC SUPPORT ASSEMBLY

Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Filed Feb. 26, 1979, Ser. No. 15,388
Claims priority, application France, Mar. 10, 1978, 78 06914
Int. Cl.[2] C25D *17/06*
U.S. Cl. 204—297 R **8 Claims**



1. A support assembly for clamping at least one workpiece to be subjected to treatment during which the temperature of the workpiece is raised above a predetermined level comprising:

(a) a carrier plate,

(b) first clamping means on said carrier plate,

(c) second clamping means on said carrier plate movable towards said first clamping means to effect securing of said workpiece between said first and second clamping means during treatment, and

(d) driving means secured to said carrier plate capable of effecting a translational movement of said second clamping means,

said driving means including

(e) a body,

(f) a temperature sensitive expansion means within said body, and

(g) a driving rod extending from said body and movable by said expansion means, which rod is caused to extend further from the body by said sensitive means to effect clamping of the workpiece by the clamping means as the temperature of the sensitive means is increased beyond said predetermined level and is caused to move back into the body when the temperature falls below said level to release the workpiece.

4,229,279

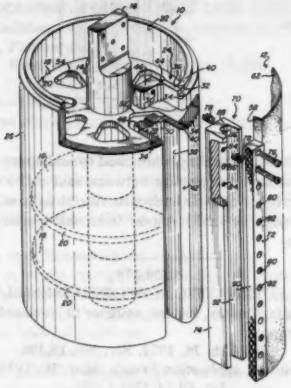
ELECTROPLATING ELECTRODE AND METHOD OF MOUNTING AN ARTICLE TO BE PLATED THEREON

Frank B. Price, Jefferson County, and Mathieu J. Vertenstein, Denver, both of Colo., assignors to Silver Engineering Works, Inc., Denver, Colo.

Filed Aug. 31, 1979, Ser. No. 71,758

Int. Cl.[2] C25C *7/00, 7/02*

U.S. Cl. 204—297 R **10 Claims**



1. In a drum-like electrode for use as a mandrel to support a sheet material wrapped therearound when being electroplated: a first channel-shaped element having a longitudinally-extending groove therein; a first tongue-forming element adapted for insertion into the groove in the first channel-shaped element; and first fastener means connecting the first channel-shaped element and first tongue-forming element together to form a first clamp subassembly effective to fasten the ends of the article to be plated together and cooperate therewith to define an endless electrically-conductive loop; a hollow cylindrical shell of electrically-conductive material sized for insertion into the endless loop defined by the article to be plated and the first clamp subassembly, said shell having a longitudinally-extending slit therein of a width substantially greater than that of the first clamp subassembly; a second channel-shaped element having a longitudinally-extending groove therein sized to receive the first clamp subassembly, said second channel-shaped element being fastened in bridging relation across the slit in the shell with its groove facing outwardly; second fastener means connected between the first clamp subassembly and the second channel-shaped element operative upon actuation to draw the former down into the groove in the latter so as to tighten the article to be plated snugly against the surface of the shell; and means within the hollow interior of the shell effective to conduct an electrical current thereto upon connection to a source of electrical energy.

4,229,280

PROCESS FOR ELECTRODIALYTICALLY CONTROLLING THE ALKALI METAL IONS IN A METAL PLATING PROCESS

Richard E. Horn, Pittsburgh, Pa., assignor to Pitt Metals & Chemicals, Inc., Pittsburgh, Pa.

Division of Ser. No. 716,225, Aug. 20, 1976, Pat. No. 4,111,772, which is a continuation-in-part of Ser. No. 579,947, May 22, 1975, abandoned. This application Apr. 13, 1978, Ser. No. 896,058

Int. Cl.[2] B01D *13/02*; C25C *1/14*

U.S. Cl. 204—301 **6 Claims**

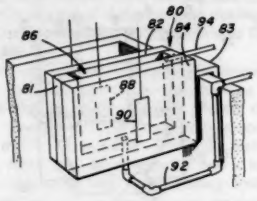
1. Apparatus for controlling the concentration of alkali metal ions in an electrochemical tin-plating bath while plating tin on a metallic member comprising,

a tin-plating tank adapted to contain a first liquid with said alkali metal ions, said tin-plating tank forming an anode compartment an anode positioned in said tin-plating tank adapted to be in contact with said first liquid,

a cathode compartment in said tank including at least one cation permselective membrane,

said cation permselective membrane positioned in said tin-plating tank,

a cathode positioned in said cathode compartment and an anode positioned in said tin-plating tank,



means to supply a second liquid to said cathode compartment,

means to withdraw said second liquid from said cathode compartment, and

said anode and cathode arranged to continuously remove a portion of said alkali metal ions from said first liquid and transfer said portion of said alkali metal ions through said cation permselective membrane into said second liquid while said metallic member is being plated with tin in said tin plating tank.

4,229,281

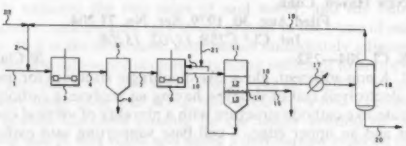
PROCESS FOR EXTRACTING BITUMEN FROM TAR SANDS

Henry E. Alquist, Bartlesville, Okla., and Allen M. Ammerman, McPherson, Kans., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1978, Ser. No. 933,346

Int. Cl.[2] C10G *1/00*

U.S. Cl. 208—11 LE **7 Claims**



1. A process for recovering bitumen from tar sands wherein bitumen is extracted from the tar sands with a solvent which process comprises contacting the bitumen solution comprising said solvent, bitumen and sand fines with water containing about 0.01 to about 0.10 weight percent of a cationic surfactant to effect the removal of said sand fines from said bitumen solution,

recovering the resulting bitumen solution thereafter and recovering bitumen from said bitumen solution.

4,229,282

CATALYTIC DEWAXING OF HYDROCARBON OILS

Alan W. Peters, Moorestown; Emmerson Bowes, Woodstown, and Thomas R. Stein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,775
Int. Cl.[3] C10G *47/16, 71/00*
U.S. Cl. 208—111 17 Claims

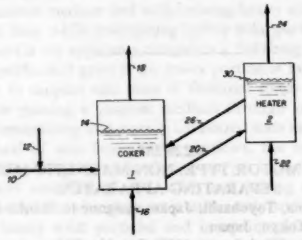
1. A process for dewaxing a hydrocarbon oil boiling above 350° F. which comprises contacting said oil and H_2 gas at a temperature of about 450° to 950° F., a pressure of 50 to 3000 psig, a space velocity of 0.1 to 20 LHSV, and an H_2 circulation rate of 500 to 20,000 SCF/bbl, with a catalyst comprising a nickel-tungsten hydrogenation component and a crystalline zeolite having an effective pore diameter greater than 5 Angstroms and a crystal framework density, in the dry hydrogen form, of not less than about 1.6 grams per cubic centimeter.

4,229,283

FLUID HYDROCOKING WITH THE ADDITION OF DISPERSIBLE METAL COMPOUNDS

John Sosnowski, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 9, 1978, Ser. No. 959,208
Int. Cl.[2] C10G *13/18*
U.S. Cl. 208—127 1 Claim



1. A fluid coking process which comprises the steps of:
(a) adding to a carbonaceous chargestock having a Conradson carbon content of at least 5 weight percent, a metal compound selected from the group consisting of metal salts of organic acids, metal phenolates, metal halides, inorganic poly acids and mixtures thereof wherein the metal constituent of said metal compound is selected from the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements and mixtures thereof,
(b) contacting the resulting mixture with hot fluidized solids in a fluidized coking bed contained in a coking zone maintained in fluidized state by the introduction of a hydrogen-containing fluidizing gas, said coking zone being maintained at a temperature ranging from about 750° F. to about 1100° F. and at a total pressure ranging from about 400 to about 3000 psig to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids,
(c) withdrawing a portion of said solids from said coking zone, and contacting at least a portion of said withdrawn solids with steam and a molecular oxygen-containing gas at a temperature ranging from about 1600° F. to about 2000° F. to produce a fuel gas and metallic ashes,
(d) recycling at least a portion of said metallic ashes to said chargestock, and
(e) discontinuing the addition of said metal compound of step (a).

4,229,284

CORROSION CONTROL METHOD USING METHOXYPROPYLAMINE (MOPA) IN WATER-FREE PETROLEUM AND PETROCHEMICAL PROCESS UNITS

James A. White, Richmond, and Thomas C. Maynard, Houston, both of Tex., assignors to Nalco Chemical Co., Oak Brook, Ill.

Continuation-in-part of Ser. No. 743,898, Nov. 22, 1976, abandoned. This application May 15, 1978, Ser. No. 905,814
The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.
Int. Cl.[3] B01D *3/34;* C10G *7/10;* C23F *11/14*
U.S. Cl. 208—348 9 Claims

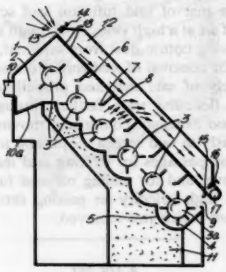
1. A process for controlling corrosion in water-free petroleum and petrochemical hydrocarbon processing system separation units consisting essentially of adding a corrosion inhibiting amount of a composition having the formula $R—O—(CH_2)nNH_2$ wherein n is 2 or 3 and R is a lower aklyl radical of not more than 4 carbon atoms to the hydrocarbon being processed in the separation unit.

4,229,285

DUST REMOVAL IN AN OPENING AND CLEANING APPARATUS FOR FIBROUS MATERIALS

Gerald Wild, Pickup Bank, Near Darwen, England, assignor to Platt Saco Lowell Limited, Helmshore, England

Filed Jun. 22, 1978, Ser. No. 918,304
Int. Cl.[3] B07B *1/04*
U.S. Cl. 209—3 13 Claims



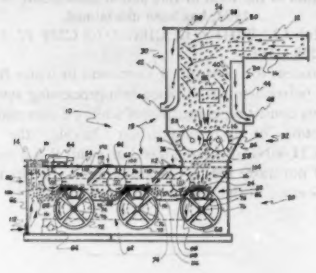
1. In an opening and cleaning apparatus for fibrous materials, including a beater, and a perforate screen positioned adjacent said beater such that said materials acted upon by said beater may contact a facing surface of said screen by impact to separate foreign materials including particulate dust and short unusable fibers from usable fibers of said fibrous materials, the improvement comprising
said screen being positioned above said beater and being formed with perforations therethrough of a prescribed size sufficient to permit said dust particles and to prevent said usable fibers to pass and from passing therethrough, and
means for providing a flow of air adjacent to and along the full perforate surface of said screen which is opposite said facing surface, said means including an inlet to said apparatus for receiving said air flow therethrough adjacent one edge of said opposite surface of said screen and an outlet from said apparatus for discharging said air flow therethrough adjacent another edge of said opposite surface of said screen, whereby said dust particles may be drawn through said perforations and into said air flow and said usable fibers are prevented from being so drawn.

4,229,286

APPARATUS AND METHOD FOR REMOVING DUST FROM TUFTS OF OPENED COTTON FIBER

Charles R. Bridges, 816 Floyd St., Kings Mountain, N.C. 28086

Filed Aug. 16, 1978, Ser. No. 934,193
Int. Cl.[3] B07B 1/22
U.S. Cl. 209—22 **33 Claims**



1. Dust removing apparatus for tufts of opened cotton fiber stock comprising

(a) entrance and exit ducts for airborne transport of said tufts, a housing therebetween and passages through said housing for the passage of said tufts therethrough;

(b) screen means disposed in said housing between said entrance duct and said exit duct;

(c) means for causing high velocity impingements of said tufts against said screen means for shaking cotton dust from said tufts and through said screen means, thereby forming a mat of said tufts on said screen means, and passing of air at a high velocity through said screen means for removing cotton dust from said mat; and

(d) means for removal of said tufts from said screen means disruptively of said mat and propelling said tufts in a tumbling floccular state farther through said passages toward said exit duct comprising moving means located contiguously to said screen means and to an interior portion of said passages for striking said mat repeatedly for said removal and for sealing off said tufts just-removed from said high velocity air passing through said screen means from which just-removed.

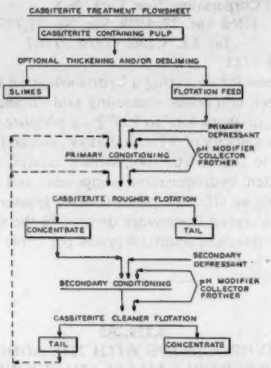
4,229,287

TIN FLOTATION

Vuko M. Lepetic, Iselin, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Dec. 4, 1978, Ser. No. 966,485
Int. Cl.[2] B03D 1/04
U.S. Cl. 209—167 **12 Claims**

12. A process for the recovery of cassiterite from an ore, ore concentrate or ore preconcentrate by froth flotation of cassiterite from gangue and optionally slimes, which comprises forming said ore, ore concentrate or ore preconcentrate into an aqueous flotation pulp, conditioning said pulp with a first depressant for gangue, and, optionally slimes that may be present, said first depressant comprising a hydrosol prepared by mixing a dilute aqueous solution of a polyvalent metal sulfate and a dilute aqueous solution of sodium silicate, subjecting the resulting conditioned pulp to rougher froth flotation in the presence of one or more collector reagents selected from the group consisting of sulfosuccinamate, phosphonic acid, aspartic acid, arsonic acid, hydroxamic acid and salts of thse acids, at a pH ranging from mildly acidic to neutral, thereby producing a rougher flotation concentrate containing cassiterite along with gangue and optionally slimes, recovering rougher flotation concentrate and conditioning it with at least one second depressant selected from the group consisting of tannic acid, activated charcoal, sodium fluorosilicate, sodium lignin sulfonate, lignin sulfonate and quebracho, subjecting the resulting pulp to at least one cleaner froth flotation operation using the same type of collector employed in the rougher



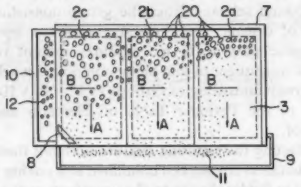
flotation operation to float cassiterite selectively, and recovering the resulting cleaner flotation concentrate or concentrates now having a substantially reduced amount of gangue and optionally slimes associated therewith.

4,229,288

LINEAR MOTOR TYPE, NON-MAGNETIC METAL SEPARATING APPARATUS

Masaru Akama, Toyohashi, Japan, assignor to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1979, Ser. No. 892
Claims priority, application Japan, Mar. 16, 1978, 53-30269
Int. Cl.[3] B03C 1/08
U.S. Cl. 209—212 **10 Claims**



1. A linear motor-type, non-magnetic metal separating apparatus comprising:

a vibration feeder provided with a vibrating deck and means for causing vibration and defining a vibrating direction of conveyance;

at least two linear motors disposed on the vibrating deck of said vibration feeder so that the advancing directions of the forces provided to non-magnetic metals to be separated by the moving magnetic fields of said linear motors are approximately parallel to one another and perpendicular to the vibratory direction of the conveyance; and

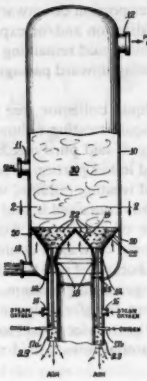
a trough disposed as a cover for said linear motors and adapted to be vibrated by said vibration feeder from the underside thereof, said trough defining a series of steps.

4,229,289

FLUIDIZED BED APPARATUS AND PROCESS

John G. Victor, Darien, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Mar. 12, 1979, Ser. No. 19,441
Int. Cl.[2] B07B 4/08; C10J 3/54, 3/56
U.S. Cl. 209—474 14 Claims



1. In an apparatus for contacting a mass of fluidized solids with a gaseous medium and withdrawing heavy solid particles from said mass while maintaining lighter solid particles in said mass wherein the apparatus comprises a fluidizing chamber, a sloping, perforated grate in the lower portion of said fluidizing chamber to support said mass of fluidized solids and having means for passing a gaseous medium through said grate to assist in maintaining said mass in a fluidized state and means for withdrawal of said heavy solid particles, the improvement comprising; said grate being sloping and perforated for passage of gas and retention of said solids and having at least one substantially continuous open slot sufficiently wide for passage of said heavy solid particles and in communication with a withdrawal conduit for preferentially removing the heavy solid particles from the fluidizing chamber and returning lighter solid particles to said mass of fluidized solids, said withdrawal conduit having a reduced cross section portion spaced from said grate open slot, and wherein said at least one open slot is: (a) an annular shaped opening in said grate and said grate comprises a conical central portion having its apex upward and an inverted truncated conical outer portion, both conical portions symmetrical about a common center line, said annular open slot being located at the intersection of the downwardly sloping conical portions, or (b) at least one straight open slot extending across substantially the entire width of said grate and said grate comprises multiple downwardly sloping portions with said at least one straight open slot located at the intersection of two downwardly sloping portions.

4,229,290

COMPACT LOW SURFACE AREA DIALYZER METHOD AND APPARATUS

Ghen M. G. Raj, 38 Forestwood Dr., Stamford, Conn. 06903

Filed Mar. 14, 1978, Ser. No. 886,458
Int. Cl.[2] B01D 13/00, 31/00
U.S. Cl. 210—646 17 Claims

1. A compact, low surface area dialyzer for extracorporeal dialysis of blood comprising:

a semi-permeable membrane suitable for blood dialysis,

first and second plates positioned against opposite surfaces of said membrane and holding said membrane in sandwiched relationship between said plates,

each of said plates having a multiplicity of spaced parallel flow channels formed therein on the side thereof adjacent to the respective surfaces of said membrane,

said first plate having first and second header passageways formed therein,

said first header passageway interconnecting one end of all of said flow channels in said first plate,

said second header passageway interconnecting the other ends of all of said flow channels in said first plate,

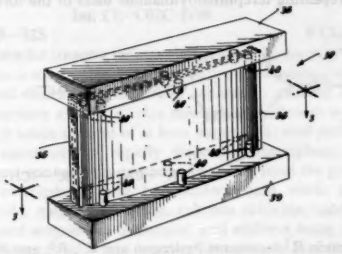
said flow channels in said first plate having a width facing said memberane and having a depth in a direction perpendicular to said membrane,

said flow channels in said first plate having a width-to-depth ratio of approximately seven,

first and second connection means connected to said first and second header passageways, respectively, for feeding a flow of dialysate into said first header passageway and out of said second header passageway, respectively, for flowing the dialysate through said multiple flow channels in said first plate in parallel flow relationship adjacent to one surface of said membrane,

said second plate having third and fourth header passageways therein,

said third header passageway interconnecting one end of all of said flow channels in said second plate,



said fourth header passageway interconnecting the other ends of all of said flow channels in said second plate,

the flow channels in said second plate being aligned with the flow channels in said first plate and being on the opposite side of said membrane from the flow channels in said first plate,

said third and fourth connection means connected to said third and fourth header passageways, for feeding a flow of blood to be dialyzed into said third header passageway and out of said fourth header passageway, respectively, for flowing the blood through said multiple flow channels in the second plate in parallel flow relationship adjacent to the opposite surface of said membrane from the dialysate for dialyzing the blood, and

the flow channels in said second plate having a depth in the direction perpendicular to said membrane and having a width facing said membrane, said flow channels in said second plate having a width-to-depth ratio of approximately twenty for exposing multiple thin wide films of flowing blood to the membrane for providing efficient exposure of the flowing blood to the surface of the membrane.

4,229,291

PERMSELECTIVE MEMBRANE AND USE

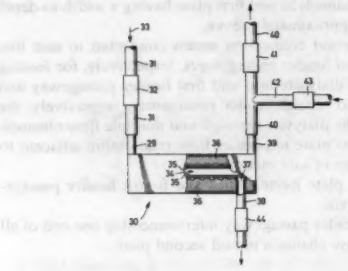
Axel Walch, Frankfurt; Jürgen Wildhardt, Wallrabenstein, and Dieter Beissel, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,269

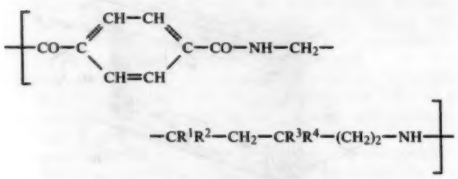
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1977, 2751910

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 F **9 Claims**



1. A permselective asymmetric membrane suitable for hemofiltration, comprised of polyamide and having a heteroporous structure, comprising a polyamide which comprises a plurality of repeating terephthaloyldiamine units of the formula:



wherein R^1 represents hydrogen and R^2, R^3, and R^4 represent lower alkyl, or R^3 represents hydrogen and R^1, R^2, and R^4 represent lower alkyl, having an ultrafiltration-capacity of from about $1.5 \cdot 10^{-3}$ to about $15 \cdot 10^{-3}$ cm/s·bar, determined for water at 0.1 bar and 20° C., a thickness of not more than about 100 microns, and a molecular weight exclusion limit of from about 20,000 to about 70,000 Dalton.

4,229,292

COUNTERCURRENT LIQUID-SOLID CONTACTING APPARATUS

Shoichi Mori; Yorifumi Ikeda, both of Suita, and Kikuo Nishikawa, Neyagawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 28, 1977, Ser. No. 865,328

Claims priority, application Japan, Dec. 31, 1976, 51-158048

Int. Cl.[2] B01D *15/06*

U.S. Cl. 210—673 **15 Claims**

8. A method of substantially purifying a liquid by countercurrent liquid-solid contact and of regenerating a purifying material used to purify the liquid, said method comprising:

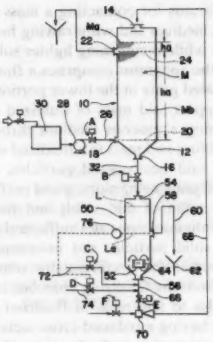
passing liquid to be purified upwardly through a bed of purifying material which is in the form of a mass of purifying particles filled within a liquid treating column and thereby purifying said liquid to form purified liquid;

withdrawing said purified liquid from said purifying bed through a liquid collector located within said liquid treating column at a position adjacent an upper portion thereof and below the top of said purifying bed;

maintaining said liquid collector at a position within said purifying bed such that an upper portion of said purifying bed, which is situated above the level of said liquid collector, alone acts on the remaining lower portion of said purifying bed below the level of said liquid collector and presses said lower portion downwardly, thereby avoiding any possible fluidization and/or expansion of said purifying particles forming said remaining lower portion of said purifying bed during upward passage therethrough of said liquid;

maintaining said liquid collector free of connection to the interior of said liquid treating column at a position above the upper surface of said purifying bed;

transferring a soiled lower portion of said purifying material within said liquid treating column, which has been soiled by suspended solids contained in said liquid being purified, from the bottom of said liquid treating column into a regenerating column by way of connecting piping extending between said bottom of said liquid treating column and the top of said regenerating column, said connecting piping having therein transfer valve means adapted to be opened to allow the transfer of said soiled lower portion of said purifying material toward said regenerating column;



supplying compressed air for a predetermined period of time into said regenerating column and thereby fluidizing the soiled purifying particles which have been transferred from said liquid treating column;

supplying a washing liquid for a predetermined period of time into said regenerating column from said bottom thereof and thereby flowing said washing liquid upwardly through the bed of said soiled purifying particles and washing said soiled particles within said regenerating column and thereby increasing the fluidization of said soiled purifying particles;

withdrawing said washing liquid and suspended solids separated from said soiled purifying particles out of said regenerating column through a liquid outlet defined in said regenerating column at an upper portion thereof;

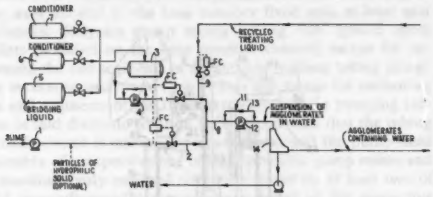
interrupting the supply of said compressed air and said washing liquid into said regenerating column and discharging regenerated purifying material from the bottom of the regenerating column; and

transporting the thus regenerated purifying material so discharged from said regenerating column toward the top of said liquid treating column and onto the top of said purifying bed within said liquid treating column.

4,229,293
DEWATERING OF SLIMES FROM PHOSPHATE ORES

Bruce F. Caswell, Whitmore Lake, Mich., and Ira E. Puddington, Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 2, 1979, Ser. No. 194
Int. Cl.[2] B01D *21/01*; C02B *1/20*
U.S. Cl. 210—727 5 Claims



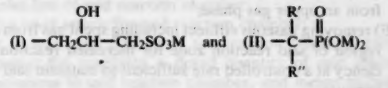
1. A process for dewatering an aqueous slime waste product of phosphate ore mining and beneficiation, said aqueous slime waste product containing from about 1 to 5 percent by weight of solid phosphate ore particles having a particle size of less than 150 mesh and the balance is essentially water, which consists essentially of the steps of: adding to said aqueous slime waste product (a) from 3 to 15 percent by weight, based on the weight of said solid particles in said aqueous slime waste product, of a hydrophobic organic bridging liquid which is immiscible with water, said hydrophobic organic bridging liquid being selected from the group consisting of liquid hydrocarbons, nitrobenzene and chlorinated liquid hydrocarbons, and (b) from 0.1 to 5 percent by weight, based on the weight of said solid particles in said aqueous slime waste product, of a liquid conditioning agent effective to render the surfaces of said solid particles hydrophobic to form a twophase liquid system, said liquid conditioning agent having a balanced hydrophilic-hydrophobic molecular structure and capable of being adsorbed by said solid particles with the hydrophobic portion oriented outwardly, said liquid conditioning agent being selected from the group consisting of tall oil, xanthates, alcohols having a large hydrocarbon nucleus and primary amines having the formula RNH_2 wherein R is alkyl having 8 to 15 carbon atoms; agitating the two-phase liquid system to effect repeated collisions of said solid particles and thereby forming in said system a dispersion of agglomerates in said liquid system, said agglomerates consisting essentially of agglomerates of said solid particles wherein said solid particles are bound together by said hydrophobic organic bridging liquid; discontinuing said agitating; and separating said agglomerates from water, said hydrophobic organic liquid and said liquid conditioning agent.

4,229,294
HYDROXYPROPYLENE-AMINO-PHOSPHONIC-SULFONIC ACIDS FOR INHIBITING SCALE FORMATION

Derek Redmore, Ballwin, and Frederick T. Welge, Affton, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 966,249, Dec. 4, 1978, which is a continuation of Ser. No. 582,862, Jun. 2, 1975, abandoned. This application May 24, 1979, Ser. No. 42,178
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—700 13 Claims

1. A process of inhibiting scale formation which comprises treating a water-carrying system with at least a threshold amount of a compound containing one to five of each of the following nitrogen-bonded groups:



where R′ and R″ are hydrogen or alkyl and M is hydrogen or a salt ion selected from alkali metal, ammonium, alkaline earth metal and the ammonium form of triethanolamine and diethanolamine, the nitrogen to which said groups are bonded being at least one amino nitrogen of a moiety which, with hydrogen replacing said nitrogen bonded groups (I) and (II), is an amine which contains hydrogen attached to nitrogen and is selected from the group consisting of monoamines of the formul RNH_2, where R is alkyl or cycloalkyl, alkanolamines, polyamines selected from alkylene polyamines and polyalkylene polyamines and said polyamines substituted in a terminal nitrogen by alkyl, cycloalkyl, aryl or aralkyl, furfurylamine, ethylenebisoxypropylamine, and cyclic amidines having an amino side chain.

4,229,295
SOLIDIFICATION OF AQUEOUS SLUDGE

David Krofchak, 160 Torbay Rd., Markham, Ontario, Canada (L3R 1G6)

Continuation-in-part of Ser. No. 804,426, Jun. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 539,125, Jan. 7, 1975, abandoned. This application Mar. 23, 1979, Ser. No. 23,104
Claims priority, application United Kingdom, Jan. 10, 1974, 1205/74
Int. Cl.[2] C02C *3/00*
U.S. Cl. 210—723 9 Claims

1. A process for treating tailings sludge from the recovery of bitumen from a source selected from the group consisting of oil sands and oil shales by a hot water separation method, said sludge comprising a slurry of clay minerals and silica in water and having a solids content of at least about 25%, said process consisting essentially of rapidly dispersing throughout the sludge at least one additive compound selected from the group consisting of sulphuric acid, hydrochloric acid, nitric acid, calcium oxide, magnesium oxide, calcium chloride, calcium hydroxide and magnesium hydroxide, said additive being provided in an amount sufficient to cause formation in said sludge of large silicate molecules with resultant solidification of the sludge by gelling and setting into an inert solid material.

4,229,296
WET OXIDATION SYSTEM EMPLOYING PHASE SEPARATING REACTOR

Robert B. Wheaton, St. Joseph, Mich., and James W. Van Kirk, Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 3, 1978, Ser. No. 930,492
Int. Cl.[2] C02C *5/04*
U.S. Cl. 210—758 7 Claims

1. A process for accomplishing wet oxidation comprising the steps of simultaneously and continuously

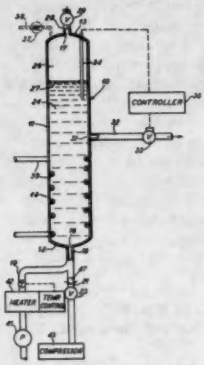
(A) charging a waste water composition containing entrained organic matter to a bottom region of a first vertically elongated reaction zone at a first flow rate,

(B) charging an oxygen-containing gas to a bottom region of said reaction zone at a second flow rate, the amount of oxygen so charged in said gas being at least sufficient to accomplish at least about a 90% COD removal from said entrained organic matter, each of said waste water and said oxygen containing gas having been pre-heated to said zone temperature before said respective chargings,

(C) maintaining said reaction zone at a zone temperature in the range from about 350° to 600° F. and at a zone pressure in the range from about 800° to 2200 psig,

(D) separating in said first reaction zone a lower liquid phase from an upper gas phase,

(E) removing gaseous effluent including spent gas from a top region of said reaction zone for increased reaction efficiency at a controlled rate sufficient to maintain said zone pressure,



(F) removing aqueous liquid effluent from a middle region of said reaction zone at a controlled rate sufficient to maintain the level of said aqueous liquid effluent in said reaction zone within narrow, fixed limits above said middle region and below said top region, and

(G) pre-pressurizing each of said waste water and said oxygen containing gas to said zone pressure before said respective chargings.

4,229,297

METHOD OF SEPARATING OIL FROM OIL-CONTAINING LIQUID

Takashi Nohmi; Takao Yamada, both of Fuji, and Yoshinao Doi, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 9, 1979, Ser. No. 2,028

Claims priority, application Japan, Jan. 10, 1978, 53/863; Dec. 13, 1978, 53/153009

Int. Cl.[2] B01D *37/00, 13/0*

U.S. Cl. 210—654 **10 Claims**

1. A method of selectively permeation-separating an oil from an oil-containing liquid which comprises: contacting

an oil-containing liquid selected from a water-in-oil type emulsion comprising an oil and a liquid other than the oil and an

oil-in-water type emulsion comprising an oil and a liquid other than the oil

with the surface of a polymeric porous membrane having pores which form passages running through the membrane from one surface thereof to the other surface thereof,

said porous membrane having at its surface a critical surface tension (γ_c) of less than 35 dynes/cm to not less than 20 dynes/cm, and having an average pore diameter (2r) of 0.03 μm to 5 μm, a pore radius distribution (r_4/r_3) of not more than 1.5 and a porosity of 1 to 85%,

the average pore radius of the porous membrane (r) and the average particle radius (r_E) of particles dispersed in the water-in-oil type emulsion or the oil-in-water type emulsion having therebetween a relationship represented by the formula $2r_E \geqq r$,

thereby causing said oil to permeate through said porous membrane.

4,229,298

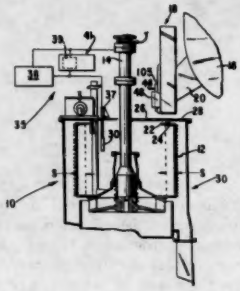
METHOD AND APPARATUS FOR DETERMINING THE THICKNESS OF A CHARGE WALL FORMED IN A CENTRIFUGAL BASKET

Joseph B. Bange, Hamilton, Ohio, assignor to The Western States Machine Company, Hamilton, Ohio

Filed Feb. 5, 1979, Ser. No. 9,154

Int. Cl.[2] B01D *33/00*

U.S. Cl. 210—787 **25 Claims**



1. The method of determining the thickness of a charge wall being formed in a charge space against the side wall of a rotating centrifugal basket by a flow of charge material into the basket, which comprises establishing a capacitance across the charge space of the basket between two spaced capacitor plates, one of said plates being spaced inwardly of said charge space, and sensing a change of said capacitance which results as the inner surface of said charge wall approaches said one capacitor plate when the thickness of said charge wall formed in said charge space is increased by said flow.

4,229,299

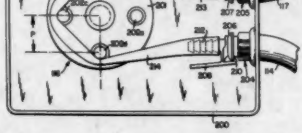
PERISTALTIC DIALYSATE SOLUTION PUMP

Steven R. Savitz, Astoria, and James A. Drago, Brewster, both of N.Y., assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 888,858

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—85 **18 Claims**



5. Hemodialysis apparatus for treatment of blood to remove waste impurities therefrom, including: dialyzer means through which waste impurity-containing blood and a dialysate solution are passed in indirect mass transfer dialyzing relationship for transfer of said waste impurities from said blood to said dialysate solution; means for transferring waste impurity-containing blood from a patient to said dialyzer means including a flexible resilient tubing pumping section through which blood is pumped and means for returning waste impurity-depleted blood to said patient forming a blood flow circuit; means for transferring dialysate solution from a negative pressure dialysate solution source to said dialyzer means and means for

discharging waste impurity-enriched dialysate solution from said dialyzer means forming a dialysate solution flow circuit including a flexible resilient tubing pumping section through which dialysate solution is pumped; peristaltic blood pump means disposed in said blood flow circuit and peristaltic dialysate pump means disposed in said dialysate solution flow circuit each pump means comprising a rotatable pump head assembly including a base member positioned for rotation about a fixed axis with a plurality of circumferentially spaced apart rollers mounted thereon for independent rotation about respective axes parallel to the base member fixed axis, at least said peristaltic dialysate pump means having four spaced apart rollers mounted on the base member thereof; means for anchoring the end segments of the flexible resilient tubing pumping section in said blood flow circuit and means for anchoring the end segments of the flexible resilient tubing pumping section in said dialysate solution flow circuit such that the tubing in each circuit is tensionally extended around the pump head assembly of a respective one of said peristaltic pump means and is simultaneously engaged and compressed by at least two of said circumferentially spaced apart rollers of the respective peristaltic pump means, the rollers of each peristaltic pump means being mounted for longitudinal movement of the points of compression along the associated tubing during rotation of said pump head assembly to advance fluid through said tubing; each of said four rollers in at least the peristaltic dialysate pump means having a generally convex surface profile, for only partial closure of the tubing at the points of compression by the rollers, with a maximum diameter between 0.25 and 0.75 inch and circumferentially spaced 90° apart from adjacent rollers with a radial distance between the roller axis and said base member fixed axis of from 0.50 to 1.50 inches; said flexible resilient tubing pumping section in the dialysate flow circuit having a length, as measured longitudinally along the tubing between the anchored end segments thereof, of from 6.75 to 11.0 inches, a wall thickness of from 0.07 to 0.125 inch, and an internal diameter of from 0.18 to 0.35 inch; and drive means coupled to the pump head assembly of the peristaltic dialysate pump means for rotation thereof at a speed in the range of from 150 to 400 rpm.

4,229,300

PROCESS FOR THE REMOVAL OF RADIOACTIVE IODINE FROM A LIQUID, ESPECIALLY URINE, AND APPARATUS TO CARRY OUT THE PROCESS

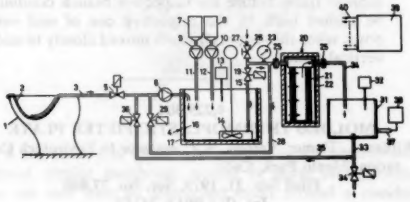
Ivan Benes, Müllerwis 23, 8606 Greifensee; Wolfgang Müller-Duysing, Niederweg 42, 8907 Wettswil, and Fritz Heinzel, Lindenweg 8, 8142 Uitikon, all of Switzerland

Division of Ser. No. 759,522, Jan. 14, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,586

Claims priority, application Switzerland, Jan. 14, 1976, 430/76

Int. Cl.² C02C *1/40*

U.S. Cl. 210—96.1 **10 Claims**



1. An apparatus for the removal of radioactive iodine from a patient's urine comprising:

(A) means in a lavatory for collecting the patient's urine said means being provided with an outlet line arranged for removing the urine free from solids;

(B) a reaction chamber having an inlet line and an outlet line;

(C) a pump and a first magnetic valve connected in series between the outlet line of said collecting means and the inlet line of said reaction chamber;

(D) a level sensor for said reaction chamber;

(E) at least two containers for reaction solutions having means for supplying a dosed quantity of said reaction solutions to said reaction chamber, said means including an electrically operating metering pump in an outlet line of each container;

(F) a mixing apparatus in said reaction chamber for mixing of said urine and said quantities of reaction solutions;

(G) a pressure pump in said reaction chamber for the conveyance of the mixed liquid from said reaction chamber through its outlet line;

(H) a filtration unit connected releasably to said outlet line of said reaction chamber via a second magnetic valve, said filtration unit having at least one outlet line;

(I) a catch container having an inlet line releasably connected to said one outlet line of said filtration unit and having at least one outlet line, said one outlet line of said catch container being connectable via a third magnetic valve with a canalization system;

(J) an electric control unit having at least one control inut connected with said level sensor in said reaction chamber and a plurality of control outputs connected with, respectively, with said pump in said outlet line of said collecting means, said first, second and third magnetic valves, said metering pumps, said mixing apparatus and said pressure pump in said reaction chamber; and

(K) a radioactive radiation detector disposed on said catch container with a control monitor connector thereto, said control monitor being adapted to open said third magnetic valve according to the quantity of liquid in said catch container and to close said third magnetic valve in case of a rise of the measured radioactivity of said quantity of liquid in said catch container beyond a certain permissible value.

4,229,301

MECHANICALLY RAKED BAR SCREEN

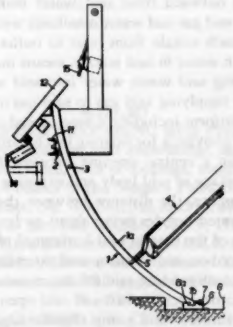
Raymond Roberts, Watford, England, assignor to Hawker Siddeley Bracket Limited, Hythe, England

Filed Jun. 16, 1978, Ser. No. 917,023

Claims priority, application United Kingdom, Jun. 23, 1977, 26309/77

Int. Cl.² E02B *5/08*

U.S. Cl. 210—159 **8 Claims**



1. A mechanically raked bar screen for removing solids from liquid flowing therethrough comprising bar mountings on which are removably mountd an array of screen bars in side-by-side spaced-apart relationship, movable rake means having tines extending between adjacent screen bars for raking from the upstream side of the screen bars the solids retained thereby and spacer means fixed to at least one bar of each pair of adjacent bars and arranged to ensure that the spacing between

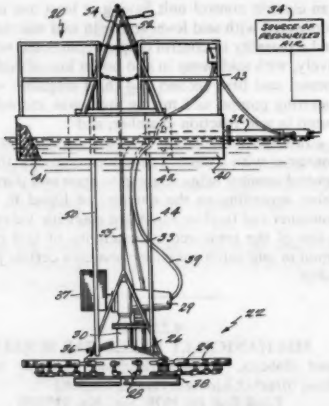
the bars of each pair of adjacent bars is not less than a minimum value, each bar being mounted on a first and a second mounting, at least one bar of each pair of adjacent bars being held against lateral movement at the first mounting, and being mounted on the second mounting for permitting lateral movement toward or away from the other bar of the pair in response to the application of force from one or more tines during raking of the bar screen.

4,229,302

WASTE TREATMENT APPARATUS WITH FLOATING PLATFORM

Allen E. Molvar, Barrington, R.I., assignor to Clevepak Corporation, White Plains, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,215
Int. Cl.[2] C02C 5/10
U.S. Cl. 210—220 14 Claims



1. An apparatus for treatment of waste water in a body of waste water comprising:

means for mixing a gas with said waste water including a water manifold, a gas manifold, a plurality of nozzles extending outward from said water manifold and connected to said gas and water manifolds with water passing through each nozzle from inlet to outlet and gas being mixed with water in said nozzle, means including a pump for pumping said waste water into said water manifold, means for supplying said gas to said gas manifold;

a floating platform including a base closed on all sides and providing bouyancy for floating in a horizontal plane, said base having a central opening between the atmosphere and the surface of said body and exposing said surface to the atmosphere, the distance between the outlets of the most separated nozzles being about no less than the least dimension of the base in said horizontal plane;

means mounted on said platform and extending through said opening for suspending said mixing means from said platform, the cross-sectional area of said opening being sufficient to withdraw said pump therethrough to a position above said platform and being at least as great as the intake area of said pump; and

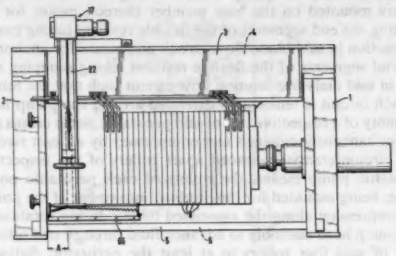
means for supplying said gas to said mixing means and forming a structural part of said platform, said supplying means comprising a conduit extending into said opening and horizontally through said base between said central opening and a peripheral surface to increase the stability of said platform.

4,229,303

FILTER PRESS WITH CLEANSING SPRAY DEVICE

Hans J. Heinrich, Wilhelmshoeher Str. 129, Ennepetal; Max Oelbermann, Max-von-Laue-Str. 3, Remscheid, and Karl A. Rademacher, Hatzfelder Str. 33, Wuppertal, all of Fed. Rep. of Germany

Filed Mar. 23, 1979, Ser. No. 23,383
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1978, 2813236
Int. Cl.[3] B01D 25/12; B08B 3/02
U.S. Cl. 210—225 9 Claims



1. In a filter press having two vertical posts and fitted with a spray washing means for one of a stack of filter plates which are displaceable on horizontal longitudinal guides of said press, said spray washing means comprising a support frame formed of vertical side girders which is movable along the stack of filter plates and surrounds the stack of filter plates together with the guides, a spray pipe with two branch conduits equipped with spray nozzles for guided up and down movement at said vertical side girders of said support frame, said nozzles of said conduits being directed towards each other, and a spray water catch basin mounted to the underside of said support frame, that improvement comprising:

said spray water catch basin having a width larger than twice the lateral spacing between said two branch conduits;

suspension means for said catch basin including securing means for attaching the center portion of the spray water catch basin to the bottom of the vertical side girders thereby permitting movement of said catch basin as a unit with said support frame and spray washing means along the entire longitudinal extent of said horizontal guides of the filter press whereby a width greater than twice the spray spacing prevents unwanted diversion of the water sprayed against the plates; and

said catch basin being movable in a horizontal direction relative to the support frame in such a way, that at least that part of the catch basin projecting at one side of the support frame before the respective branch conduit will be pushed back by the respective one of said vertical posts, when the support frame is moved closely to said one vertical post.

4,229,304

MOLDED THERMOPLASTIC FILTER PLATE

William L. Fismer, Verona, N.J., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Sep. 21, 1979, Ser. No. 77,865
Int. Cl.[3] B01A 25/12
U.S. Cl. 210—231 12 Claims

1. A generally rectangular molded thermoplastic filter plate for use in a filter press of the type used for separating solids from a liquid wherein a plurality of filter plates are brought together in abutting relationship and filtration is accomplished by passing a liquid through filter cloths disposed between adjacent filter plates, comprising:

a. a peripheral rim extending completely around the perime-

ter of and integral with an inner web such that an inner drainage face is formed on each side of said filter plate, each side of said filter plate being divided into four triangular sectors, the boundary of each sector lying generally along a line extending from the center of said inner drainage face to a corner of said peripheral rim of said filter plate, from said corner along the outer edge of said peripheral rim to an adjacent corner of said peripheral rim, and from said adjacent corner back to the center of said inner drainage face such that each of said sectors includes a corresponding side of said peripheral rim; and

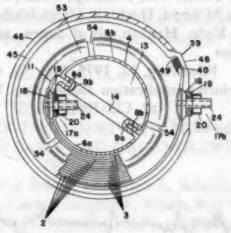
b. a plurality of drainage ribs molded on said inner drainage face in each of said sectors such that a majority of said ribs of a particular sector are parallel to the corresponding side of said peripheral rim in that particular sector.

4,229,305

HAEMODIALYZER

Luciano Fecondini, Bologna, and Andrea Bocchi, Medolla, both of Italy, assignors to Hospal Ltd., Basel, Switzerland

Filed Dec. 11, 1978, Ser. No. 967,901
Claims priority, application Italy, Dec. 15, 1977, 69802 A/77
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 B **14 Claims**



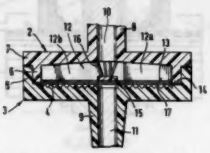
1. A haemodialyzer of the type comprising a semipermeable flattened tubular membrane wound in spiral configuration from one end with an interposed insert around a mandrel member, means for connecting the interior of said membrane at its ends to conduits for the admission and discharge of blood, the assembly being housed in a casing, in which said mandrel member comprises at least two elongated elements of identical transverse configuration which are connected together along their opposite longitudinal edges and one corresponding pair of said opposite longitudinal edges sealingly grips said membrane.

4,229,306

HOUSING FOR SINGLE-USE FILTER UNITS

Wolfgang Hein, and Klaus Cosack, both of Dassel, Fed. Rep. of Germany, assignors to Carl Schleicher & Schüll GmbH & Co. KG, Einbeck, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,365
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809321
Int. Cl.[3] B01D *25/04*
U.S. Cl. 210—446 **10 Claims**



1. In a single-use filter housing of the type used in pressure filtration operations and comprising first and second housing parts secured together in fluid-tight manner to define a chamber in which a filter element is to be positioned; the second housing part including a central outlet duct for the filtrate; the first housing part including a central charging duct for delivering the medium to be filtered, and a plurality of ribs extending radially inwardly from an outer rim of the first housing part and including edges located at least immediately adjacent the surface of the filter element positioned within the housing; the improvement comprising baffle disk means for diverting the medium radially outwardly in all directions over the surface of the filter element arranged on an axis of the charging duct in spaced relation therefrom, the baffle disk means being supported solely by at least some of said ribs and sized to completely cover the profile of the charging duct as viewed in plan, the baffle disk means including a first side arranged substantially coplanar with said edges of the ribs, said ribs and said baffle disk means being arranged and dimensioned to enable said filter element to resist upstream and downstream piercing, up to pressures which would otherwise burst said housing.

4,229,307

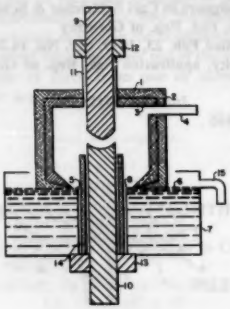
APPARATUS FOR PREPARING RED PHOSPHORUS

Edward J. Lowe, Stourton, near Stourbridge, and Frederick A. Ridgway, Stourbridge, both of England, assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 703,341, Jul. 8, 1976, abandoned, which is a division of Ser. No. 528,583, Nov. 9, 1974, Pat. No. 4,013,756, which is a division of Ser. No. 188,604, Oct. 12, 1971, Pat. No. 3,861,882, which is a continuation of Ser. No. 599,915, Dec. 7, 1966, abandoned. This application Dec. 13, 1978, Ser. No. 970,495
Int. Cl.[2] B01K *1/00*; C25B *1/00, 11/12*
U.S. Cl. 250—543 **7 Claims**

1. An apparatus for converting phosphorus vapor into red phosphorus comprising an arc chamber, a tank containing a cooling liquid in direct communication with said arc chamber, a pair of electrode rods disposed within said arc chamber and adapted to form an arc within said chamber, a phosphorus vapor source, chamber inlet means connected to said source for channeling phosphorus vapor into said chamber, chamber

outlet means in the base of said chamber for removing heated phosphorus vapor from the chamber, said outlet means being



submerged in said tank of cooling liquid, and tank outlet means for removing red phosphorus containing liquid.

4,229,308

POLYMER LUBRICATING OIL ADDITIVES BEARING NITROGEN GROUPS AND THEIR USE AS ADDITIVES FOR LUBRICATING OILS

Daniel Brulet, Claye Souilly, and Bernard Chauvel, Ermont, both of France, assignors to Rhone-Poulenc Industries and Institut Francais du Petrole, both of Paris, France

Filed Jan. 26, 1979, Ser. No. 6,867

Claims priority, application France, Feb. 8, 1978, 78 03462; Feb. 8, 1978, 78 03463

Int. Cl.³ C10M *1/38*

U.S. Cl. 252—47 **31 Claims**

1. A lubricating oil polymer additive produced by subjecting a living polymer of a number average molecular weight Mn of between about 20,000 and 300,000, prepared by anionic polymerization of at least one C_4–C_6 conjugated diene or a copolymer of a C_4–C_6 conjugated diene with a vinyl aromatic compound to a functionalization operation by reaction with a nonpolymerizable heterocyclic nitrogen compound having at least two groups of the structure <C—N+C>; and to a hydrogenation to hydrogenate at least about 85 percent of the olefin double bonds.

19. A lubricating oil polymer additive according to any of claims **1** to **4**, wherein the nonpolymerizable nitrogen compound is a heterocyclic compound selected from among polypyridines having less than 20 pyridyl groups, pyrimidine and its derivatives, pyrazine and its derivatives, 2,4,6-tri(2-pyridyl)-1,3,5-triazine, and dipyridyl sulfide.

30. A lubricating oil improved by the addition of 0.1 to 10 percent of its weight of a polymer additive according to any of claims **1** to **4**.

4,229,309

MAGNESIUM-CONTAINING DISPERSIONS

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 18, 1977, Ser. No. 816,626

Int. Cl.² C10M *1/10, 3/02;* C10L *1/12;* C01B *13/14*

U.S. Cl. 252—25 **20 Claims**

1. A process of preparing a stable, fluid magnesium oxidecontaining dispersion which consists essentially of heating a composition comprising a non-volatile process fluid containing $Mg(OH)_2$ and a dispersant to the dehydration temperature of $Mg(OH)_2$ until all the water has been removed, said non-volatile process fluid being capable of being heated to the dehydration temperature of $Mg(OH)_2$, and said dispersant being capable of retaining the magnesium compound formed by dehydration in stable suspension.

4,229,310

LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,396

Int. Cl.³ C10M *1/46*

U.S. Cl. 252—49.9 **16 Claims**

1. A reaction product made by the steps of (1) forming a partial ester of a polyhydric alcohol with a monocarboxylic acid, wherein the acid is present to the extent of at least 1 mole thereof per mole of the alcohol, but less than the amount required to react with all the alcohol hydroxyls, and (2) reacting the material of (1) with from about 0.25 mole to about 3.0 moles per mole of (1) of a phosphorus oxyhalide or a trihydrocarbyl phosphate.

9. A lubricant composition comprising a lubricant and an antiwear or demulsifying amount of the product of claim **1**.

4,229,311

LUBRICATING OIL ADDITIVES

Franz Wenzel, Darmstadt; Ulrich Schoedel, Rossdorf; Heinz Jost, Messel, and Hans Pilz, Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,620

Int. Cl.³ C10M *1/32;* C08K *5/01*

U.S. Cl. 252—50 **17 Claims**

1. A method for making a polymer-in-oil solution, useful for improving the viscosity-temperature relationship and low-temperature properties of lubricating oils when added thereto, which method comprises polymerizing a methacrylic acid ester of an alcohol having 8 to 18 carbon atoms in a solution, in a lubricating oil, of a polyolefin polymer of an olefinic hydrocarbon monomer having two to four carbon atoms, the oil solution of said polyolefin having a viscosity of less than 15,000 centistokes at 100° C., adding further polyolefin polymer of the type defined herein to said solution, and then graft copolymerizing a polymerizable heterocyclic compound having a basic nitrogen atom in the ring thereof onto the resulting mixed polymers as backbone polymers.

4,229,312

METHOD OF MANUFACTURING A PAINT COMPOSITE FOR MAGNETIC FILMS

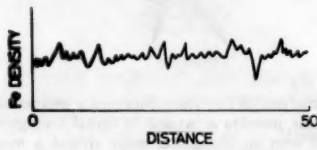
Waichi Nagashiro, Hachioji; Hajime Fukke, Inagi; Yoshiki Kato; Teruo Tsunoda, both of Tokyo; Teruaki Kobayashi, Hachioji; Yoichi Oba, Hachioji; Katsuyoshi Chiba, Hachioji; Munehisa Mitsuya, Hachioji; Heigo Ishihara, Kokubunji, and Mitsushi Endo, Hadano, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 13, 1979, Ser. No. 66,234

Claims priority, application Japan, Aug. 11, 1978, 53-97212

Int. Cl.² H01F *10/02*

U.S. Cl. 252—62.54 **13 Claims**



1. A method of manufacturing a paint composite for magnetic films which comprises a first step of grinding a mixture under a shear stress of 10–400 kg/cm², the mixture comprising 100 parts by weight of a magnetic powder, 1.5–30 parts by weight of at least one polymer selected from the group consisting of polyvinylbutyral polyvinylformal and polyvinyl acetate, and 20–60 parts by weight of a solvent for the polymer, a

second step of adding 40–290 parts by weight of a solvent for the polymer to the ground mixture and then grinding the mixture, and a third step of adding 10–70 parts by weight of an epoxy resin, 10–70 parts by weight of a phenol resin and 0–450 parts by weight of a solvent for the polymer to the resultant mixture and further grinding the resultant mixture.

4,229,313

ALKALI METAL HYPOCHLORITE BLEACHING AND CLEANING COMPOSITIONS THICKENED WITH BRANCH CHAIN AMINE OXIDES

David R. Joy, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 11, 1978, Ser. No. 932,935

Claims priority, application United Kingdom, Sep. 2, 1977, 36713/77

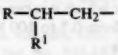
Int. Cl.[2] **C11D** *7/54, 3/30, 9/42*

U.S. Cl. 252—98 **13 Claims**

12. A cleaning or bleaching composition comprising:

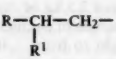
(1) from 1 to 20 percent by weight of the composition of an alkali metal hypochlorite, measured as available chlorine,

(2) from 0.1 to 5 percent by weight of a mixture of 40 to 60 weight percent straight chain amine oxide and 60 to 40 weight percent branched chain amine oxide, the amine oxide containing a

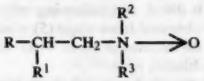


group,

where R is a straight chain C_5 to C_{17} alkyl group and R^1 is a C_1 to C_3 alkyl group, and the group



contains 8 to 20 carbon atoms, the amine oxide in toto having the formula:



where R^2 and R^3, which may be the same or different, are each alkyl groups containing up to 6 carbon atoms, and (3) balance water.

4,229,314

2-OXABICYCLOOCTANE DERIVATIVES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

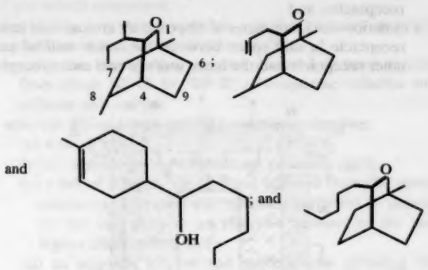
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Hoimdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 8,924, Feb. 2, 1979, Pat. No. 4,197,328, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Jun. 27, 1979, Ser. No. 52,333

Int. Cl.[2] **C11D** *3/50, 9/44*

U.S. Cl. 252—174.11 **6 Claims**

1. A process for augmenting or enhancing the aroma of a solid or liquid detergent consisting of the step of intimately admixing with a solid or liquid detergent base from 0.01% up to 0.5% by weight of said detergent base of at least one cyclic chemical compound having a structure selected from the group consisting of:



4,229,315

LIQUID CRYSTALLINE CYCLOHEXANE DERIVATIVES

Joachim Krause; Rudolf Eidenschink, both of Dieburg, and Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

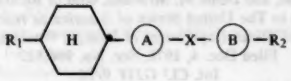
Filed Jan. 5, 1979, Ser. No. 1,084

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800553

Int. Cl.[3] **C09K** *3/34;* **C02F** *1/13;* **C07C** *69/76, 69/74, 121/52*

U.S. Cl. 252—299 **12 Claims**

1. A cyclohexane derivative of the formula



wherein

the rings A and B are identical or different and are each a 1,4-disubstituted phenyl or 1,4-trans-disubstituted cyclohexyl ring;

X is —CO—O— or —O—CO—;

R_1 is alkyl of 1–8 carbon atoms;

and R_2 is alkyl of 1–8 carbon atoms, and when the ring B is phenyl, R_2 is alkyl, alkoxy or alkanoyloxy, each of up to 8 carbon atoms, or —CN.

4,229,316

DEVICE FOR THE STORAGE OR DISPOSAL OF RADIOACTIVE WASTES

Henning Baatz, Essen, and Dieter Rittscher, Heiligenhaus, both of Fed. Rep. of Germany, assignors to Steag Kernenergie GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 875,079

Int. Cl.[2] **G21F** *5/00*

U.S. Cl. 252—301.1 W **10 Claims**

1. A packaging system for the disposal of radioactive wastes of different radiation intensities, comprising:

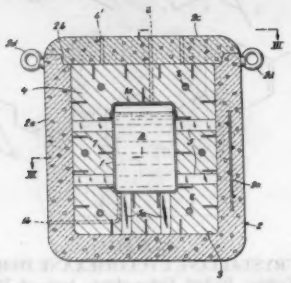
an outer receptacle of a standard size uniform for all of said intensities and of a predetermined radiation absorbing capacity;

a plurality of inner receptacles of different volumes adapted to receive radioactive waste, a selected one of said inner receptacles being enclosed within said outer receptacle and having a volume determined by the intensity of the radiation emitted by the radioactive waste thereof with a smaller inner receptacle receiving waste of greater radiation intensity and a larger inner receptacle receiving waste of lesser radiation intensity;

spacer means for centering the selected inner receptacle within said outer receptacle so that the space between the outer receptacle and the selected inner receptacle is

greater for the smaller receptacles than for the larger receptacles; and

a radiation-shielding material disposed all around said inner receptacle in said space between the outer wall of said inner receptacle and the inner walls of said outer receptacle so that the thickness of the radiation-shielding materials around the selected inner receptacle is greater for the smaller inner receptacles with waste of greater radiation intensity than for the larger receptacles with waste of lesser radiation intensity.



4,229,317

METHOD FOR IMMOBILIZING RADIOACTIVE IODINE

Harry Babad, and Denis M. Strachan, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 4, 1978, Ser. No. 966,522

Int. Cl.[2] G21F *9/16*

U.S. Cl. 252—301.1 W **3 Claims**

1. A method of incorporating radioactive iodines, present as sodium or potassium iodides or iodates in an aqueous nitrate-free solution, into an inert, solid material suitable for long-term storage comprising:

adding an effective amount of alumina, silica and an alkali metal selected from the group consisting of sodium and potassium to the solution for the formation of a sodalite;

stirring the solution to form a homogeneous mixture;

drying the mixture to form a powder; and

compacting and heating the powder to at least 6.9 mPa at 1073 to 1373 K (800° to 1100° C.) for a time sufficient to form an inert solid sodalite compact suitable for long-term storage.

4,229,318

MANUFACTURE OF A TITANIUM-CONTAINING COMPONENT FOR CATALYSTS OF THE ZIEGLER-NATTA TYPE

Heinz Mueller-Tamm; James F. R. Jaggard, both of Ludwigshafen, and Hans Schick, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 935,948

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739382

Int. Cl.[3] B01J *31/02*

U.S. Cl. 252—429 B **7 Claims**

1. A process for the manufacture of a titanium-containing component of a catalyst for the Ziegler-Natta homopolymerization or copolymerization of α-monoolefins of 3 to 6 carbon atoms, by milling together (a) a titanium-containing compound of the general formula

$$TiCl_3 . nAlCl_3$$

where

n is a number from 0.01 to 1 and (b) an ester of a total of 2 to 34 carbon atoms, having the general formula

$$R^3—O—CO—R^4$$

or

$$R^3—O—CO—\underset{\displaystyle R^4}{\overset{\displaystyle R^4}{C}}=CH$$

where

R^3 is (I) alkyl of 1 to 16 carbon atoms or (II) phenylalkyl of a total of 7 to 23 carbon atoms, in which up to 5 hydrogens of the phenyl may be substituted by alkyl of 1 to 4 carbon atoms, and

R^4 is (I) hydrogen, (II) alkyl of 1 to 18 carbon atoms, (III) phenylalkyl of a total of 7 to 23 carbon atoms, in which up to 5 hydrogens of the phenyl may be substituted by alkyl of 1 to 4 carbon atoms, (IV) phenyl or (V) alkylphenyl of a total of 7 to 23 carbon atoms, in which up to 4 hydrogens of the phenyl may be substituted by alkyl of 1 to 5 carbon atoms,

wherein

(1) a vibratory ball mill having a milling acceleration of from 30 to 80 $m.sec^{-2}$ is used,

(2) the mill is first charged with the titanium-containing compound (a), after which it is run at from −50° to +100° C. for a period of from 0.5 to 100 hours in the absence of a diluent, thereafter

(3) whilst milling, with the material in the mill at from −50° to +80° C., the amount of the ester (b) which corresponds to a molar ratio of aluminum in the titanium-containing compound (a) to ester (b) of from 1:5 to 1:0.05 is added continuously or in small portions, at a rate of from 0.01 to 200 ml per minute per 2.5 kg of titanium-containing compound (a), in the absence of a diluent, then (4) the material in the mill is brought to from +10° to +100° C. whilst being milled, and is kept in this temperature range for from 5 to 150 hours, after which

(5) the product obtained from stage (4) is washed with at least 0.6 times its amount by weight of a hydrocarbon which is liquid under normal conditions and boils below 150° C., and is dried, and following which

(6) the product obtained from stage (5) is milled for a period of from 5 to 60 minutes at from −50° to −10° C. in the absence of a diluent, next

(7) the product obtained from stage (6) is brought together with at least 0.5 times its amount by weight of a promoter of the general formula

$$SiX_xR^5_{4-x}$$

with the proviso that if two or more radicals R^5 are present in the compound, these radicals are identical with one another, or of the general formula

$$SiX_yR^5_{4-y}$$

with the proviso that if two or more radicals R^5 are present in the compound, at least two of these radicals are different from one another, or of the general formula

$$SnX_yR^5_{4-y},$$

$$Si(OR^5)_zR^5_{4-z}$$

or

$$SiPhR^5_3$$

with the proviso that if two or more radicals R^5 are present in the compound, these radicals are identical with one another or at least two of these radicals are different from one another,

in which general formulae
x is from 0 to 4,
y is from 0 to 3,
z is from 1 to 3,
X is halogen,
R^5 is (I) hydrogen, with the proviso that in none of the compounds more than three of these radicals are hydrogen , (II) alkyl of 1 to 12 carbon atoms or (III) phenyl, and
Ph is phenyl, in which from 0 to 5 hydrogens of the phenyl may be substituted by alkyl or alkoxy of 1 to 5 carbon atoms, phenyl or phenoxy, chlorine or trialkylsilyl, where alkyl is of 1 to 5 carbon atoms, and the batch is kept at from 0° to 250° C. for a period of from 0.2 to 10 hours and is separated into a solid-phase product and a liquid-phase product, and thereafter
(8) the solid-phase product obtained from stage (7) is washed with at least 0.4 times its amount by weight of a hydrocarbon which is liquid under normal conditions and boils below 150° C. or of a promoter listed under (7), and is dried, following which
(9) the product obtained from stage (8) is milled for a period of from 5 to 60 minutes at from −50° to 0° C. in the absence of a diluent.

4,229,319

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 954,684, Oct. 25, 1978, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Jun. 15, 1979, Ser. No. 48,957
The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.
Int. Cl.[3] **B01J** *27/08, 27/10, 23/66*
U.S. Cl. 252—441 **16 Claims**

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of a silver component.

6. A catalytic composite as defined in claim **1** wherein the porous carrier material contains a catalytically effective amount of a halogen component.

4,229,320

CATALYST FOR MAKING PARA-XYLENE

Lynn H. Slaugh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 22, 1979, Ser. No. 5,653
Int. Cl.[3] **B01J** *21/04, 21/08, 23/04, 23/14, 23/36*
U.S. Cl. 252—454 **6 Claims**

1. A catalytic composition which is prepared by a process which consists essentially of impregnating a neutral or weakly acidic support with an aqueous solution of a non-halogen containing water soluble rhenium compound before or after impregnating the support with an alkali metal hydroxide or stannate, with the proviso that the support is calcined after impregnation with said rhenium compound, and then reducing the impregnated support with hydrogen at elevated temperatures sufficient to reduce the rhenium component to its metallic state while leaving the alkali metal hydroxide or stannate largely unreduced.

4,229,321

PROCESS FOR MAKING A SILVER CATALYST

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,510
Int. Cl.[2] **B01J** *23/50*
U.S. Cl. 252—476 **26 Claims**

1. A process for making a highly-active silver catalyst for the vapor phase epoxidation of ethylene with an oxygen-containing gas which comprises:
contacting a porous, inorganic, catalyst support material with an impregnating solution; and,
heating the impregnated support material at temperatures from about 50° C. to 300° C. to evaporate volatiles and activate said catlyst,
wherein the said impregnating solution comprises:
(a) a silver salt,
(b) an organic amine solubilizing/reducing agent,
(c) a salt of a higher alkali metal selected from the group consisting of cesium and rubidium sufficient to deposit on the said support an effective amount of the said higher alkali metal, and
(d) an aqueous solvent and subsequently abrading the surface of the catalyst to remove about 1 to about 10 weight percent of the catalyst.

4,229,322

CERAMIC COMPONENT FOR ELECTRODES

David D. Marchant, and J. Lambert Bates, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1978, Ser. No. 961,152
Int. Cl.[2] **F01B** *1/06*
U.S. Cl. 252—521 **2 Claims**

1. A ceramic component for an MHD generator electrode having the formula:

$$Y_x(Mg_yCr_z)_wAl_{(1-w)}O_3$$

where
x=0.9 to 1.05,
y=0.02 to 0.2,
z=0.8 to 1.05 and
w=1.0 to 0.5.

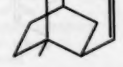
4,229,323

NOR-DEHYDROPATCHOULOL

Paul J. Teisseire, and Pierre Maupetit, both of Grasse, France, assignors to Societe Anonyme Roure Bertrand Dupont, Argenteuil, France

Filed Aug. 23, 1972, Ser. No. 283,152
Claims priority, application France, Sep. 1, 1971, 71.31577
Int. Cl.[3] **C07C** *35/37;* **C11B** *9/00, 9/02*
U.S. Cl. 252—522 R **5 Claims**

1. A solid product, nor-dehydropatchoulol, having a melting point of 180° to 183° C. and having the structural formula



and being substantially free from hydrocarbons, epoxides, alcohols and sesquiterpene ketones occurring in Patchouli Oil.

2. An odoriferous composition in which there has been incorporated the nor-dehydropatchoulol of claim **1**.

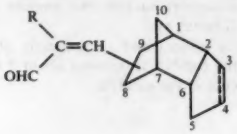
4,229,324

TRICYCLO-α,β-UNSATURATED ALDEHYDE

Naotake Takaishi, Ichikai; Yoshiaki Inamoto, Utsunomiya, and Masamoto Matsukane, Funabashi, all of Japan, assignors to Kao Soap Company, Limited, Tokyo, Japan

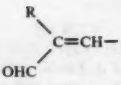
Filed Apr. 26, 1979, Ser. No. 33,511
Claims priority, application Japan, May 4, 1978, 53-53620
Int. Cl.[2] **C07C** *45/08, 47/34;* **A61K** *7/46*
U.S. Cl. 252—522 R **11 Claims**

1. An endo-tricyclo-α,β-unsaturated aldehyde represented by the formula (I),



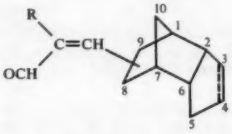
(I)

wherein the group

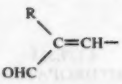


is attached to the exo side of the norbornane ring at the 8- or 9-position, R represents an alkyl group having 1 to 6 carbon atoms, and the dotted line between carbon 3 and carbon 4 represents a saturated or ethylenically unsaturated bond.

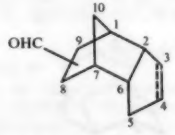
3. A process for producing an endo-tricyclo-α,β-unsaturated aldehyde represented by the formula (I),



wherein the group



is attached to the exo side of the norbornane ring at the 8- or 9-position, R represents an alkyl group having 1 to 6 carbon atoms, and the dotted line between carbon 3 and carbon 4 represents a saturated or ethylenically unsaturated bond, which comprises reacting 8- or 9-exo-formyl-endo-tricyclo[5.2.1.$0^{2,6}$]deca-3-ene or 8-exo-formyl-endo-tricyclo[5.2.1.$0^{2,6}$]decane represented by the formula (III),



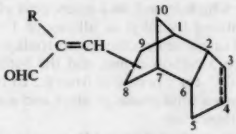
(III)

wherein the group OHC— is attached to the exo side of the norbornane ring at the 8- or 9-position, and the dotted line between carbon 3 and carbon 4 represents a saturated or ethylenically unsaturated bond, or a mixture thereof, with an aliphatic aldehyde represented by the formula (IV),

$$R—CH_2CHO \quad (IV)$$

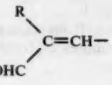
wherein R is the same as defined above.

11. A perfume composition comprising an endo-tricyclo-α,β-unsaturated aldehyde represented by the formula (I),



(I)

wherein the group



is attached to the exo side of the norbornane ring at the 8- or 9-position, R represents an alkyl group having 1 to 6 carbon atoms, and the dotted line between carbon 3 and carbon 4 represents a saturated or ethylenically unsaturated bond.

4,229,325

HIGH UNSATURATION BUTYL RUBBERS WITH ADDITIVES

Warren A. Thaler, Matawan, N.J.; Donald J. Buckley, Plainfield, N.J., and Kennedy, Joseph P., Akron, Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 788,504, Apr. 18, 1977, Pat. No. 4,151,343, which is a continuation-in-part of Ser. No. 631,444, Nov. 13, 1975, Pat. No. 4,031,300, which is a continuation-in-part of Ser. No. 457,109, Apr. 1, 1974, Pat. No. 3,928,297, which is a continuation-in-part of Ser. No. 151,038, Jun. 8, 1971, Pat. No. 3,808,177. This application Oct. 11, 1978, Ser. No. 950,417
Int. Cl.[2] **C08C** *19/30;* **C08J** *3/24;* **C08K** *5/36*
U.S. Cl. 260—5 **46 Claims**

1. A vulcanizable composition which comprises:

(a) a substantially gel free copolymer consisting of a major portion on one isoolefin having about 4 to about 10 carbon atoms and about 5 to about 45 mole % of one conjugated diene having about 5 to about 9 carbon atoms, said copolymer having an Mn from 90,000 to below 120,000, said one isoolefin being selected from the group consisting of isobutylene, 2-methyl-1-butene, 3-methyl-1-butene or 4-methyl-1-pentene, and said diene being selected from the group comprising isoprene, piperylene or methyl cyclopentadiene;

(b) a vulcanizing amount of a sulfur donor; and

(c) a delayed action accelerator.

22. A vulcanizable composition which comprises:

(a) a substantially gel free terpolymer consisting of a major portion of an isoolefin having about 4 to about 10 carbon atoms and a minor portion of an acyclic conjugated diene having about 5 to about 9 carbon atoms and a cyclic conjugated diene having about 5 to about 9 carbon atoms, a mole % unsaturation of said terpolymer being at least about 8 mole % and an Mn of said terpolymer being from 90,000 to below 120,000, said isoolefin being selected from the group comprising isobutylene, 2-methyl-1-butene, 3-methyl-1-butene or 4-methyl-1-pentene, said acyclic diene being selected from the group comprising isoprene or piperylene, and said cyclic conjugated diene being selected from the group consisting of cyclopentadiene and methylcyclopentadiene;

(b) a vulcanizing amount of sulfur donor; and

(c) a delayed action accelerator.

4,229,326

METHOD FOR PRODUCING GRAFT COPOLYMERS OF CELLULOSE OR PROTEIN FIBER WITH VINYL MONOMERS

Boris P. Morin, ulitsa Novatorov, 40, korpus 19, kv. 13; Galina J. Voinova, ulitsa akademika Petrovskogo, 5, kv. 53; Irina P. Breusova, ulitsa Belovezhskaya, 49, kv. 30; Galina I. Stanchenko, ulitsa Molodogvardeiskaya, 24, kv. 101, and Zakhar A. Rogovin, ulitsa Donskaya, 24, kv. 68, all of Moscow, U.S.S.R.

Filed Feb. 2, 1979, Ser. No. 8,942
Int. Cl.[3] C08L *1/02, 89/00*
U.S. Cl. 260—8 **7 Claims**

1. A method for producing graft copolymers of a natural polymer, selected from the group consisting of cellulose and protein fibers, with vinyl monomers, comprising the steps of impregnating the natural polymer selected from the group consisting of cellulose and protein fibers with an aqueous solution of ferrous salt, removing excessive ions of ferrous iron, and grafting vinyl monomers to said natural polymer from an aqueous solution, aqueous emulsion or aqueous dispersion of a vinyl monomer, containing hydrogen peroxide and a reducing agent which is selected from the group consisting of sodium sulfide, glucose, sodium hypophosphite, sodium bitartrate and hydroquinone, and used in an amount of 0.002 to 0.02 percent by mass.

4,229,327

COATINGS FOR POLYOLEFINIC PRODUCTS AND PRODUCTS COVERED BY SKID COATINGS

Donato Jacobone, Milan, Italy, assignor to Frypan S.p.A., Italy

Filed Jan. 2, 1979, Ser. No. 431
Claims priority, application Italy, Jan. 16, 1978, 19269 A/78
Int. Cl.[3] C08L *1/18*
U.S. Cl. 260—13 **7 Claims**

1. A coating composition for polyolefinic products which consists essentially of an organic solution of a dry polymeric system comprising:

(a) about 50–60 parts by weight of a first component selected from the group consisting of acrylic homopolymers, copolymers and mixtures thereof;

(b) a second component consisting of a polyester resin obtained by condensation, in a weight percent ratio of about 1–50%; and

(c) about 10–30 parts by weight of a third component selected from the group consisting of medium viscosity nitrocellulose, low viscosity nitrocellulose and mixtures thereof.

4,229,328

ELECTRICALLY CONDUCTIVE RESIN COMPOSITION

Yoshimi Makino, and Hidetoshi Shimizu, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 964,256
Int. Cl.[2] C08L *1/14*
U.S. Cl. 260—16 **13 Claims**

1. A resin composition comprising:

(A) 20 to 70 parts by weight of an unsaturated polyester being radically copolymerizable, having an average molecular weight between 500 and 5000, and having a degree of unsaturation between 150 and 190,

(B) 1 to 25 parts by weight of a thermoplastic resin having an average molecular weight between 1×10^4 and 1×10^7,

(C) 30 to 70 parts by weight of a liquid of at least one ethylenically unsaturated monomer being radically reactive with said unsaturated polyester and being able to dissolve said unsaturated polyester and said thermo-plastic resin,

(D) 0.05 to 1.0 parts by weight of an electrically conductive fiber-like material having a length between 1 and 10 millimeters and an aspect ratio between 2 and 10^3, on the basis of the total amount of said unsaturated polyester, said thermoplastic resin and said ethylenically unsaturated compound being 100 parts by weight; and

(E) not more than 40 parts by weight of an electrically conductive powder material having a diameter between 10 and 300 microns, on the basis of the total amount of said unsaturated polyester, said thermo-plastic resin and said ethylenically unsaturated compound being 100 parts by weight.

9. A resin composition according to claim 1, in which said thermoplastic resin is selected from homopolymers of methylmethacrylate, ethylmethacrylate, buthylmethacrylate, methylacrylate and ethylacrylate, a coporymer of methylmethacrylate with lower alkyl ester of acrylic acid and/or methacrylic acid, copolymers of methylmethacrylate with a little of one or more kinds of laurylmethacrylate, isobornylmethacrylate, acryl amide, hydroxyethylmethacrylate, styrene, 2-ethylhexylacrylate, acrylonitrile, methacrylic acid, methacryl amide, methylol acryl amide, and cetyl stearyl methacrylate, styrene-acrylonitrile copolymer, vinyl chloride-vinyl acetate copolymer, cellulose acetate buthylate, and cellulose acetate propionate.

4,229,329

FIRE RETARDANT COATING COMPOSITION COMPRISING FLY ASH AND POLYMER EMULSION BINDER

Herbert Bennett, 260 Lenox Rd., Apt. 2A, Brooklyn, N.Y. 11226

Continuation-in-part of Ser. No. 831,407, Sep. 8, 1977, abandoned. This application Feb. 15, 1979, Ser. No. 12,514
Int. Cl.[3] C08L *1/28*
U.S. Cl. 260—17 R **7 Claims**

1. A fire retardant coating composition consisting essentially of:

finely pulverized fly ash	24%–50%
a binder consisting essentially of low viscosity vinyl acrylic type emulsion polymer having the properties of being stable and compatible with fire retardant ingredients and of forming a film which is tough, flexible and resistant to cracking, has outstanding permanence, durability and binding capacity and is flame resistant, smokeless and free of emission of toxic vapors when heated, said binder being selected from the group consisting of UCAR Latex 5000 and RHOPLEX AC-234	7%–31%
Water	8%–48%
Fine Fibreglass Flakes of Fibre	0%–10%
Inorganic Pigment	0%–10%
Low Foaming Dispersing Agent	0%–5%
Water Capatible Defoamer	0%–10%
Plasticizer selected from the group consisting of 2,2,4-trimethyl -1,3 pentanediol monoisobutyrate and tricresyl phosphate	0%–1%
Thickner consisting essentially of hydroxyethyl cellulose	0%–1%
Drying Agent	0%–6%
Water Soluble Preservative	0%–1%
Compatible Fungicide 2-amino-2-methyl-1-propanol to control the pH of the composition and inhibit corrosion of metal surfaces to which the composition is applied	0%–1%
Amorphous Silica	0%–32%
Surfactant consisting essentially of nonylphenoexy-poly(ethyleneoxy ethanol	0%–1%

4,229,330
PROCESS FOR PRODUCING PHENOLIC RESINS

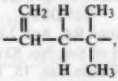
Susumu Konii, Tokyo; Yukio Yoshimura, Saitama-ken; Ken Nanaumi, Shimodate; Kohei Yasuzawa, Shimodate; Takeshi Yoshida, Shimodate, and Toyotaro Shinko, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Aug. 28, 1978, Ser. No. 937,114
Claims priority, application Japan, Aug. 29, 1977, 52/104035; Aug. 29, 1977, 52/104037
Int. Cl.[2] C08G *8/32*
U.S. Cl. 260—19 R 20 Claims

1. A process for producing an internally plasticized phenolic resin which comprises reacting a compound of the formula

(I)

wherein R_1 is an alkylene residue having 1 to 3 carbon atoms; and R_2 and R_3 are independently hydrogen or a saturated or unsaturated hydrocarbon group having 1 to 3 carbon atoms, or R_1, R_2 and R_3 together form a group of the formula:



with an epoxidized vegetable oil with heating in the presence of one or more secondary and/or tertiary amines, and adding formaldehyde or one or more phenols and formaldehyde to the reaction system to further proceed the reaction.

4,229,331
PROCESS FOR PRODUCING WATER-EMULSIFIABLE AIR-DRYING BINDERS, THE BINDERS, AND EMULSIONS MADE THEREFROM

Bertram Zäckert, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Dec. 6, 1978, Ser. No. 966,867
Claims priority, application Austria, Dec. 12, 1977, 8838/77
Int. Cl.[2] C09D *3/54, 3/56, 3/66*
U.S. Cl. 260—20 27 Claims

1. Process for producing water-emulsifiable airdrying paint binders based on modified drying oils, characterized in that in a first reaction step

10–35% by weight of a polyethylene glycol with an average molecular weight of between about 500 and 5000, and

5–25% by weight of a low molecular weight formaldehyde condensate of a mono (C_3–C_9) alkyl phenol and/or aryl phenol obtained through alkaline condensation, are reacted at from about 100° to 160° C., and the reaction product is condensed in a second reaction step at from about 180° to 250° C. with

40–85% by weight of a substantially hydroxy-free ester of unsaturated oil fatty acids and polyols and the obtained product in a third reaction step is processed to provide an alkyd resin or oil binder, the weight ratios and reaction conditions being chosen whereby the final product has a level of from about 4 to 12% by weight of polyethylene glycol and an acid value of from about 10 to 30 mg KOH/g.

4,229,332
AROMATIC COPOLYESTER COMPOSITION

Kayomon Kyo, Kyoto; Yasuhiko Asai, Uji; Isamu Hirose, and Minolu Kishida, both of Kyoto, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

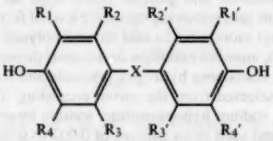
Filed Dec. 13, 1977, Ser. No. 860,411
Int. Cl.[2] C08G *63/46, 63/48, 63/76*
U.S. Cl. 260—22 T 22 Claims

1. An aromatic copolyester composition comprising:

(A) an aromatic copolyester prepared by reacting

(a) a mixture of terephthalic acid and/or a functional derivative thereof and isophthalic acid and/or a functional derivative thereof, with the terephthalic acid unit/isophthalic acid unit molar ratio being about 9:1 to about 1:9, and

(b) a bisphenol of the general formula (I)



(I)

wherein —X— is a member selected from the group consisting of —O—, —S—, —SO_2—, —SO—, —CO—, an alkylene group containing 1 to 4 carbon atoms and an alkylidene group containing 1 to 4 carbon atoms, and R_1, R_2, R_3, R_4, R'_1, R'_2, R'_3 and R'_4, which may be the same or different, each is a member selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 4 carbon atoms, or a functional derivative thereof, and

(B) a salt of an organic carboxylic acid containing 1 to 22 carbon atoms and a metal of Groups I, II, III or IV of the Periodic Table.

4,229,333
CROSS-LINKABLE RUBBER MIXTURES CONTAINING SILICATE FILLERS AND PROCESS FOR CROSS-LINKING

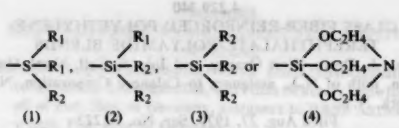
Siegfried Wolff, Bornheim-Merten, and Ewe H. Tan, Wesseling-Berzdorf, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 835,848, Sep. 22, 1977, abandoned, which is a continuation of Ser. No. 609,815, Sep. 2, 1975, abandoned. This application Apr. 27, 1979, Ser. No. 34,203
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1975, 2536674
Int. Cl.[2] C08K *3/36, 5/54*
U.S. Cl. 260—23.7 M 83 Claims

1. An elemental sulfur free cross-linkable rubber composition comprising a rubber capable of being cross-linked by sulfur, a siliceous filler in an amount of 1 to 300 parts per 100 parts by weight of the rubber, carbon black in an amount of 0 to 300 parts by 100 parts by weight of the rubber, the total of siliceous filler and carbon black not exceeding about 300 parts per 100 parts by weight of the rubber, a vulcanization accelerator for a sulfur cross-linkable rubber in an amount of 0.02 to 10 parts per 100 parts by weight of the rubber and a sulfur containing organosilicon compound having the formula:

$$Z—Alk—S_x—Alk—Z$$

in which Z is:



(1) (2) (3) (4)

where R_1 is alkyl of 1 to 4 carbon atoms, cycloaklyl of 5 to 8 carbon atoms or phenyl, R_2 is alkoxy of 1 to 4 carbon atoms, cycloalkoxy of 5 to 8 carbon atoms or phenoxy, Alk is a divalent aliphatic hydrocarbon or a cyclic hydrocarbon group containing 1 to 8 carbon atoms and x is a number from 2 to 6 in an amount of 0.2 to 40 parts per 100 parts of siliceous filler, said sulfur containing organosilane compound being the sole vulcanizing agent.

4,229,334

PLASTIC MODIFIED WRITING COMPOSITIONS

Bedrich Klabacka; Josef Polansky, and Josef Hynek, all of Ceske Budejovice, Czechoslovakia, assignors to Koh-i-noor Hardtmuth, oborovy podnik, Czechoslovakia

Filed Dec. 19, 1978, Ser. No. 971,112

Claims priority, application Czechoslovakia, Dec. 22, 1977, 8718-77

Int. Cl.[3] C08L *23/06*; C09D *13/00, 5/06*

U.S. Cl. 260—28.5 A **4 Claims**

1. Inscribing composition comprising a solid homogeneous mixture of:

a. Polyethylene, and

b. A water miscible component selected from the group consisting of polyethyleneglycol, nonionic water soluble waxes, nonionic ethylene adducts of higher fatty acids, and mixtures thereof, and

c. Wax, and

d. Color Pigment, and

e. Filler material.

4,229,335

AQUEOUS DISPERSION OF POLYAMINO POLYHYDROXY POLYETHER RESINOUS ADDUCT AND ACID-FUNCTIONAL AMINOPLAST FOR CATHODIC ELECTROCOATING

Vincent W. Ting, Brunswick, Ohio, and James M. Evans, Lynn Haven, Fla., assignors to SCM Corporation, Cleveland, Ohio

Division of Ser. No. 874,809, Feb. 3, 1978, Pat. No. 4,159,233. This application Mar. 14, 1979, Ser. No. 20,529

Int. Cl.[3] C08L *61/28*

U.S. Cl. 260—29.4 R **9 Claims**

1. A liquid aqueous dispersion suitable for use in cathodic electrocoating art and comprising:

(A) an aqueous medium having pH from about 3 to 9 and containing an acid with a pK_a not greater than about 5;

(B) a substantially oxirane-free, non-gelled, resinous adduct of

(i) a substantially oxirane-free precursor adduct of a polyether diepoxide having molecular weight from about 300 to 10,000 and a polyamine having molecular weight from about 60 to 600 and

(ii) a mono-epoxide having molecular weight from about 100 to 500 and having a normal alkyl group of at least about 4 carbon atoms pendant through only hydrolysis-resistant linkages from the epoxy group of said mono-epoxide,

the mole ratio of residues of said mono-epoxide to residues of said diepoxide in said resinous adduct being from about 0.2:1 to 2:1, the mole ratio of residues of said polyamine to residues of said diepoxide in said resinous adduct being from about 1.25:1 to 2:1, and said polyamine having from 2 to 5 amine groups per molecule and at least sufficient amino hydrogens to react with substantially all of the epoxy groups of both said diepoxide and said mono-epoxide; and

(C) from about 0.05 to 0.4 weight parts, per weight part of said resinous adduct, of an aminoplast resin having at least about 1 gram-equivalent, per 1,000 grams of said aminoplast resin, of carboxylic acid groups with pK_a from about 2 to 6 for catalyzing the heat-induced cure of said resinous adduct with said aminoplast resin.

4,229,336

SELF CROSS-LINKING N-METHYLOL FUNCTIONAL EMULSION POLYMERS USING POLYCARBOXYLIC ACID SURFACTANT

Bruce G. Sicklesteel, Hoffman Estates, and Dale F. Anders, Fox River Grove, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Feb. 1, 1979, Ser. No. 9,397

Int. Cl.[2] C08L *33/24*

U.S. Cl. 260—29.6 NR **14 Claims**

1. A self cross-linking aqueous emulsion coating composition comprising water having emulsified therein an emulsion polymer comprised of copolymerized monoethylenically unsaturated monomers including at least about 3 percent by weight of a C_2–C_8 saturated alcohol ether of a monoethylenically unsaturated N-methylol functional monomer, said monomers being emulsified during copolymerization by a polycarboxylic acid emulsifying agent partially neutralized with a base to provide a pH of at least about 4, said polycarboxylic acid emulsifying agent being present at about 0.5 to about 10 percent by weight of said monomers and being an addition copolymer having an average molecular weight in the range of about 600 to about 3000 and containing at least about 25 mole percent of copolymerized monoethylenically unsaturated carboxylic acid, the balance of the monomer in said addition copolymer being monoethylenically unsaturated monomer of hydrophilic character, said addition copolymer chain being terminated with a mercaptan containing at least 8 carbon atoms.

4,229,337

AROMATIC AMIDE PLASTICIZER FOR IONIC POLYMERS

Douglas Brenner, Livingston, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 2, 1978, Ser. No. 947,431

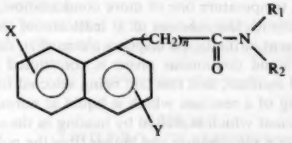
Int. Cl. C08k *5/20*

U.S. Cl. 260—32.6 A **18 Claims**

1. An elastomeric composition including:

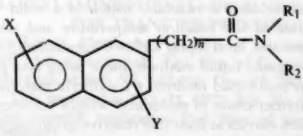
(a) a neutralized sulfonated elastomeric polymer having about 15 to about 50 meq. sulfonate groups per 100 grams of said neutralized sulfonated elastomeric polymer, said sulfonate groups having metal cations; and

(b) at least 8 parts by weight of an aromatic organic amide per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said organic amide having a formula selected from the group consisting of:



(i)

or



(ii)

wherein n equals 0, 1, 2, 3, or 4, R_1 and R_2 are independently selected from the group consisting of hydrogen,

and C, to C_4 straight and branched chain alkyl groups, wherein X and Y are independently selected from the groups consisting of hydrogen, C_1 to C_4 straight and branched chain alkyl groups.

4,229,338

SUEDE-LOOK SHOE SOLES

David R. Hansen, and Glenn R. Himes, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 11, 1979, Ser. No. 38,037

Int. Cl.[3] C08K *5/01*

U.S. Cl. 260—33.6 AQ **8 Claims**

1. A footwear composition having a simulated suede appearance comprising:

(a) 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 350,000, said blocks A comprising 8–65% by weight of the copolymer;

(b) about 5 to about 125 parts by weight of a styrene polymer;

(c) about 5 to about 175 parts by weight of a hydrocarbon extending oil;

(d) about 2 to about 150 parts by weight of a finely divided silica filler;

(e) about 0.1 to about 10 parts by weight of a pigment; and

(f) about 5 to about 50 parts by weight of a synthetic fiber selected from the group consisting of polyamide fibers, polyester fibers, acrylic fibers, and mixtures thereof;

wherein the various components are melt blended at a temperature below the melting point of said synthetic fiber.

4,229,339

PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS

John Bentley; Morice W. Thompson, both of Maidenhead, and Auguste L. L. Palluel, Windsor, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 9, 1977, Ser. No. 795,307

Claims priority, application United Kingdom, May 12, 1976, 19487/76

Int. Cl. C08k *5/01, 5/03*

U.S. Cl. 260—34.2 **16 Claims**

1. A process for the preparation of a dispersion of a condensation polymer in which the links between the reactants which form the polymer involve atoms other than carbon and in which a low molecular weight by-product is eliminated during the polymerisation reaction by which said polymer is made in an organic liquid medium in which the polymer is insoluble, the process comprising heating in the said liquid medium at the polymerisation temperature one or more condensation polymer-forming reactants, the reactant or at least one of the reactants being present in the liquid disperse phase of an emulsion of which the liquid continuous phase is constituted by the aforesaid liquid medium, said reactant being selected from the group consisting of a reactant which is liquid at normal temperature, a reactant which is melted by heating in the organic liquid medium at a temperature not higher than the polymerisation temperature, and a reactant which is a solid which cannot be melted at the reaction temperature and which is dissolved in a second, inert liquid which is substantially immiscible with the organic liquid medium, there being also present dissolved in the said liquid medium a polymeric material having a single polymer chain of molecular weight between 1000 and 20,000 which carries at least one reactive group capable of taking part in the condensation polymer-forming reaction, said single polymer chain being a homopolymer or a random copolymer but not a block or graft copolymer.

4,229,340

GLASS FIBER-REINFORCED POLYETHYLENE TEREPHTHALATE/POLYAMIDE BLENDS

Melvin L. Druin, West Orange, and John S. Gall, North Haledon, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,223

Int. Cl.[2] C08K *7/14;* **C08L** *67/02*

U.S. Cl. 260—40 R **6 Claims**

1. An improved thermoplastic molding resin comprising a synthetic linear polyamide polymer having a relative viscosity in the range of from about 35 to about 100; from about 5 to about 60 weight percent based on the total composition of glass fiber reinforcing agent; and from about 1.0 to about 50 weight percent based on the total resin weight of polyethylene terephthalate.

4,229,341

METHOD OF MAKING THERMALLY EXPANSIBLE RUBBER TUBES FOR USE IN SELF-CLOSING GAS PIPES AND PIPE JOINTS

Yukio Yamaguchi, Seto; Kenji Ishihara, Nagoya, and Kikuo Yonekura, Tokushima, all of Japan, assignors to Toho Gasu Kabushiki Kaisha, Nagoya and Kabushiki Kaisha Togowa Gomu Seizosho, Osaka, both of, Japan

Division of Ser. No. 877,566, Feb. 13, 1978. This application Feb. 15, 1979, Ser. No. 12,290

Int. Cl.[2] C08K *9/04*

U.S. Cl. 260—42.16 **7 Claims**

1. A method of manufacturing thermally expansible rubber tube, comprising:

mixing about 2 to 30 parts by weight of oxidized, thermally expansible graphite powder with 100 parts by weight of raw rubber;

adding a predetermined quantity of a curing agent and a cure accelerator to cure the mixture of said rubber and graphite; and

forming said mixture into a tubular shape, said rubber tube being thermally expansible from 10 to 500 times in size when heated to between 180° C. and 260°C.

4,229,342

PROCESS FOR EXTRACTING PROTEINS FROM MILK USING SILICA AND ANION EXCHANGE RESINS

Bernard Mirabel, Fresnes, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed May 15, 1978, Ser. No. 905,845

Claims priority, application France, May 18, 1977, 77 15320

Int. Cl.[2] A23J *1/20*

U.S. Cl. 260—120 **12 Claims**

1. Process for extracting proteins and casein from milk, characterized in that the proteins other than the casein are first extracted by putting skimmed milk into contact first with at least one anion exchanger resin and then in a subsequent and separate step with silica in the absence of an ion exchange resin, or by putting skimmed milk into contact first with silica in the absence of an ion exchange resin then in a subsequent and separate step with at least one anion exchanger resin whereby proteins become fixed on the anion exchange resin and the silica, leaving a solution containing casein mineral salts and lactose and eluting the protein and separating the casein remining in solution from the mineral salts and lactose.

4,229,343
AZO DYES FROM AN OXADIAZOLYL-SUBSTITUTED ANILINE

Helmut Junge, Wachenheim; Walter Kurtz, Ludwigshafen; Peter Dimroth, Ludwigshafen, and Hans Scherer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

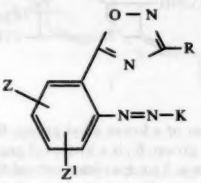
Continuation of Ser. No. 776,222, Mar. 10, 1977, abandoned, which is a continuation of Ser. No. 561,004, Mar. 21, 1975, abandoned. This application Jul. 13, 1978, Ser. No. 924,196

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1974, 2417217; Dec. 6, 1974, 2457687

Int. Cl.³ C09B 29/18

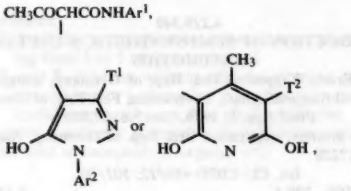
U.S. Cl. 260—156 5 Claims

1. A compound of the formula

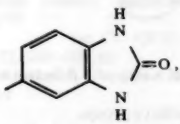


in which

K is



Ar^1 is phenyl; phenyl substituted by chlorine, methoxy, ethoxy, methyl, acetylamino or benzoylamino; or



Ar^2 is phenyl; or phenyl substituted by chlorine, methyl or sulfamoyl,

T^1 is methyl or carbamoyl,

T^2 is cyano or carbamoyl,

Z is hydrogen, chlorine, bromine or trifluoromethyl,

Z^1 is hydrogen, chlorine, or bromine, and

R is phenyl; phenyl substituted by chlorine, bromine, hydroxy, methoxy, ethoxy, C_1 to C_4 alkyl, cyano, carbamoyl, nitro, phenyl, sulfamoyl, N-phenylsulfamoyl, acetylamino or benzoylamino; naphthyl; N-phenylphthalimidyl; or pyridyl.

4,229,344
MONAZO PIGMENTS CONTAINING HYDROXYNAPHTHOYLAMINOBENZIMIDAZALONE RADICAL

Rolf Müller, Aesch; Armand Roueche, Bottmingen; Paul Müller, Basel, and Karl Ronco, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

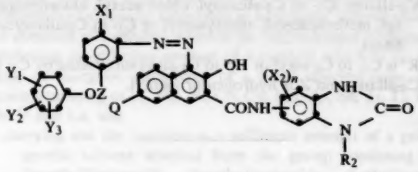
Filed May 30, 1978, Ser. No. 911,002

Claims priority, application Switzerland, Jun. 3, 1977, 6868/77

Int. Cl.² C09B 29/36, 43/12; D06P 1/52, 1/649

U.S. Cl. 260—157 7 Claims

1. A monoazo pigment of the formula



wherein

Z represents —CO— or —SO_2—,

Q represents hydrogen, bromine or methoxy,

Y_1 represents hydrogen, chlorine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

Y_2 and Y_3 independently represent a hydrogen, chlorine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkanoylamino of 2 to 4 carbon atoms or the —$COOR_1$, wherein

R_1 represents alkyl of 1 to 4 carbon atoms which is unsubstituted or substituted by halogen, alkoxy of 1 to 4 carbon atoms; cycloalkyl of 5 to 6 carbon atoms; benzyl which is unsubstituted or substituted by halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; or phenyl which is unsubstituted or substituted by halogen, alkyl of 1 to 4 carbon atoms or alkoxy groups of 1 to 4 carbon atoms, or

Y_2 and Y_3 together with the carbon atoms to which they are attached form benzene ring which is unsubstituted or substituted by chlorine,

X_1 represents hydrogen, chlorine, an alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms or phenoxy,

R^2 represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl which is unsubstituted or substituted by halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

X_2 represents hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or a phenoxy, and

n is 1 or 2.

with the proviso that if R_2 represents alkyl or phenyl, at least one of Y_1, Y_2 or Y_3 may not represent hydrogen.

4,229,345
(2-CHLORO-4-CYANOPHENYL) (4-DIALKYLAMINOPHENYL)-DIAZINE DYE USEFUL FOR TRANSFER PRINTING

Gunther Lamm, Hassloch, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

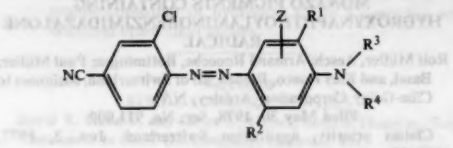
Continuation of Ser. No. 643,108, Dec. 22, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 846,817

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1975, 2500071

Int. Cl.² C09B 29/08, 29/26, 29/36; D06P 3/26

U.S. Cl. 260—205 7 Claims

1. A dye of the formula



in which
R^1 is hydrogen,
R^2 is C_1- to C_4-alkyl,
R^3 is C_1- to C_4-alkyl or C_2- to C_4-alkyl substituted by C_1- to C_6-alkoxy, C_1- to C_4-alkanoyl, chloroacetyl, chloropropionyl, methoxyacetyl, ethoxyacetyl or C_1- to C_4-alkoxycarbonyl,
R^4 is C_1- to C_6-alkyl or C_2- to C_4-alkyl substituted by C_1- to C_4-alkoxy and Z is hydrogen or methyl.

4,229,346

PRODUCTION OF HEXAMETHYLENIMINE

Herbert Toussaint, Frankenthal; Klaus Adelsberger, Neckargemuend, and Herwig Hoffmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1975, Ser. No. 556,469

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1974, 2414930

Int. Cl.³ C07D *295/02*

U.S. Cl. 260—239 B **12 Claims**

1. A process for the continuous manufacture of hexamethylenimine which comprises passing hydrogen and a liquid phase of hexamethylene diamine in an inert liquid solvent through a reaction zone in contact with a hydrogenation catalyst containing, as catalytically active compounds, at least one of the metals selected from the group consisting of nickel, cobalt, iron, manganese, silver, copper and chromium and maintained at 120° to 280° C. and 0.1 to 50 bars pressure, said inert solvent having a boiling point at atmospheric pressure of at least 140° C. and the concentration of said hexamethylene diamine in the reaction mixture being about 3 to 10% and continuously distilling off hexamethylenimine from said reaction zone.

4,229,347

LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

John B. Holt, and Arthur Ibbotson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 28, 1979, Ser. No. 24,774

Claims priority, application United Kingdom, Apr. 11, 1978, 14130/78

Int. Cl.² C07C *119/048;* **C07D** *229/00*

U.S. Cl. 260—239 A **14 Claims**

1. A liquid diphenylmethane diisocyanate composition comprising diphenylmethane-4,4'-diisocyanate containing not more than 10% by weight of isomers thereof in which from 10% to 35% of the isocyanate groups have been reacted with a mixture of alkylene glycols containing at least three constituent glycols each having at least three carbon atoms, one of said glycols being dipropylene glycol, tripropylene glycol or a higher polypropylene glycol.

4,229,348

PENICILLANIC ACID DERIVATIVES

Nobuhiro Oi, Hoya; Bunya Aoki, Tama; Teizo Shinozaki, Matsudo; Kanji Moro, Kuki; Isao Matsunaga, Tokyo; Takao Noto, Machida; Toshiyuki Nebashi, Kawagoe; Yusuke Harada, Tokyo; Hisao Endo, Yokohama; Takao Kimura, Chiba; Hiroshi Okazaki, Sayama; Haruki Ogawa, Chofu, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

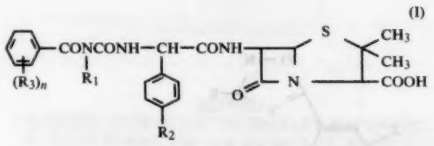
Filed Jan. 23, 1979, Ser. No. 5,832

Claims priority, application Japan, May 26, 1978, 53/62164; Jun. 13, 1978, 53/70365; Aug. 11, 1978, 53/97309; Aug. 29, 1978, 53/104362; Sep. 7, 1978, 53/109157

Int. Cl.³ C07D *499/68*

U.S. Cl. 260—239.1 **19 Claims**

1. A compound represented by the formula



(I)

wherein R_1 is a hydrogen atom or a lower alkyl group; R_2 is a hydrogen atom or a hydroxyl group; R_3 is a hydroxyl group or a lower alkanoyloxyl group; n is 2 or 3; at least two of R_3 are bonded to adjacent carbon atoms, the position of substituent R_3 being selected from 3 to 5 position when R_1 is a lower alkyl group and R_3 is a hydroxyl group, and 2 to 6 position when R_1 and R_3 are other substituents, or a pharmaceutically acceptable salt thereof.

15. 6-[α-{3-(3,4,5-Trihydroxybenzoyl)-3-methyl-1-ureido}-α-phenylacetamido]penicillanic acid according to claim 1.

4,229,349

PRODUCTION OF SEMI-SYNTHETIC β-LACTAM ANTIBIOTICS

Werner Ertel, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

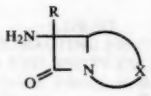
Filed Apr. 5, 1979, Ser. No. 27,539

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817228

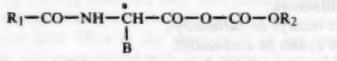
Int. Cl.² C07D *499/12, 501/06*

U.S. Cl. 260—239.1 **7 Claims**

1. In the production of a semi-synthetic β-lactam antibiotic by reacting an amino compound of the formula



in which
X is the remaining members of a ring of a β-lactam antibiotic, and
R is a hydrogen atom or a methoxy group,
with an activated carboxylic acid derivative of the formula



in which
R_1 is an organic radical,
B is an optionally substituted phenyl, cyclohexadienyl or heterocyclyl radical and
R_2 is a lower alkyl radical,
the improvement which comprises effecting the reaction in an

acetone/water mixture which contains acetone and water in a volume ratio of about 0.5:1 to 3:1.

4,229,350

DIBENZO[d,g][1,3,6]DIOXAZOCINE DERIVATIVES

László Rozsa; Lujza Petöcz; Katalin Grasser; Ibolya Kosóczky; Enikö Kiszelly, and József Nagy, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

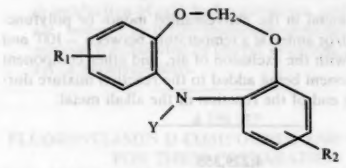
Division of Ser. No. 927,934, Jul. 25, 1978. This application Jul. 26, 1979, Ser. No. 61,042

Claims priority, application Hungary, Aug. 2, 1977, EE 2515

Int. Cl.[2] **C07D** *413/06*

U.S. Cl. 260—243.3 **3 Claims**

1. Compounds of the general formula I

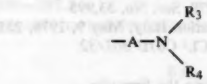


(I)

wherein

R_1 and R_2 independently represent hydrogen or halogen, and

Y stands for a group of formula



wherein

A stands for a straight or branched chained alkylene having from 2 to 5 carbon atoms and

R_3 and R_4 together with the adjacent nitrogen atom form a piperidino or a piperazino group, wherein the heterocyclic ring may have a C_{1-4} alkyl substituent,

and pharmaceutically acceptable acid addition salts thereof formed with an inorganic or organic acid.

4,229,351

PROCESS FOR PRODUCING ALIPHATICALLY N-SUBSTITUTED MALEIMIDES

Jürg Kiefer, Reinach, and Theobald Haug, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

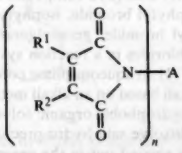
Filed Mar. 28, 1979, Ser. No. 24,847

Claims priority, application Switzerland, Apr. 6, 1978, 3706/78

Int. Cl.[3] **C07D** *207/448, 207/452*

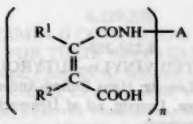
U.S. Cl. 260—326.26 **6 Claims**

1. An improved process for producing maleimides of formula I



(I)

in which n is one of the numbers 1, 2 or 3, R^1 and R^2 are independently hydrogen or methyl, A is an n-valent aliphatic, cycloaliphatic, aliphatic-cycloaliphatic or aliphatic-aromatic radical having up to 30 carbon atoms by means of the cyclizing dehydration at a temperature range of 40° to 100° C. of a maleamic acid of the formula II



(II)

in which the acid amide group is attached to aliphatic or cycloaliphatic C atoms in the presence of a low-molecular weight dehydrating carboxylic anhydride in an organic solvent and in the presence of a catalyst wherein the improvement comprises employing an effective amount of a catalyst which is an organic or inorganic compound of a metal selected from the group consisting of Li, Mg, Ni, Co, Cu, Mn, Zn, Sn, Ti, Tl, Fe. Pb, V and La, and

carrying out the reaction in a sufficient amount of a polar aprotic solvent selected from the group consisting of dimethylformamide, dimethylacetamide, diethylacetamide, tetramethylurea, hexamethyl phosphoric acid triamide, N-methylcaprolactam, N-methylpyrrolidone and mixtures thereof, to give at least a partial solution of the starting materials.

4,229,352

BENZYLPYRROLYLMETHYL ESTERS OF CYCLOPROPANE CARBOXYLIC ACIDS

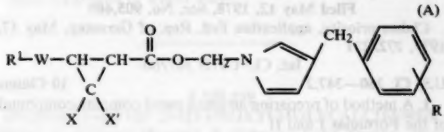
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 942,509, Sep. 15, 1978. This application Aug. 13, 1979, Ser. No. 66,263

Int. Cl.[3] **C07D** *207/32*

U.S. Cl. 260—326.43 **17 Claims**

1. A compound of the formula (A):



(A)

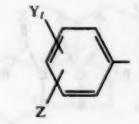
wherein,

W is oxygen or sulfur;

X is lower alkyl or halogen;

X′ is hydrogen, lower alkyl or halogen;

R^1 is lower alkyl, lower haloalkyl, lower alkenyl, lower haloalkenyl, or the group



in which

t is zero, one, two, three or four;

Y is independently selected from hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylcarbonyl, lower alkoxycarbonyl, lower acyloxy, halogen, cyano, nitro and lower haloalkylthio;

Z is independently selected from the values of Y, cycloalkyl and lower haloalkoxy; or together with Y forms a methylenedioxy group; and

R is hydrogen, fluoro, bromo, chloro, trifluoromethyl, methyl, methoxy or methylthio.

4,229,353

(2,2-DISUBSTITUTED VINYL)γ-BUTYROLACTONES

Per D. Klemmensen, Lemvig; Hans Kolind-Andersen, Harboor, and Hans B. Madsen, Lemvig, all of Denmark, assignors to A/S Cheminova, Denmark

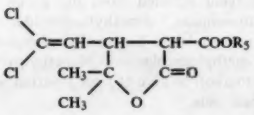
Division of Ser. No. 922,552, Jul. 7, 1978, abandoned, which is a continuation of Ser. No. 756,906, Jan. 4, 1977, abandoned. This application Apr. 3, 1979, Ser. No. 26,746

Claims priority, application United Kingdom, Jan. 21, 1976, 02380/76; May 25, 1976, 21631/76

Int. Cl.³ C07D *307/32*

U.S. Cl. 260—343.6 **3 Claims**

1. A (2,2-Disubstituted Vinyl)-γ-butyrolactone of the formula:



in which R_5 is C_1 or C_2 alkyl.

4,229,354

METHOD OF PREPARING ALKALI METAL COMPLEX COMPOUNDS

Borislav Bogdanovic, Mülheim/Suki, Fed Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mülheim/Suki, Fed. Rep. of Germany

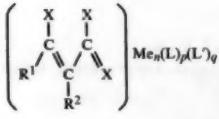
Filed May 12, 1978, Ser. No. 905,489

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722221

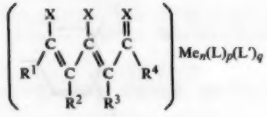
Int. Cl.³ C07D *307/06*

U.S. Cl. 260—347.2 **10 Claims**

1. A method of preparing an alkali metal complex compound of the Formulas I and II

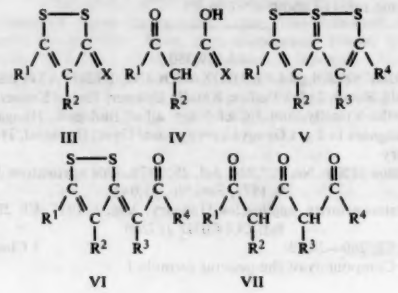


I



II

wherein Me represents an alkali metal, each X represents sulphur or oxygen, n represents a whole number from 3 to 20, L and L′ represents a mono- or polyfunctional ether or amine, respectively, p and q are whole numbers from 0 to 4, R^1, R^2, R^3, R^4 are each hydrogen, alkyl, cycloalkyl, aralkyl or aryl moieties and/or two or more such moieties closed to form an aliphatic or aromatic ring system, which comprises reacting an appropriate compound of the following general formulas III, IV, V, VI or VII,



III IV V

VI VII

with an alkali metal in the above-named mono- or polyfunctional ether and/or amine at a temperature between −100° and +100° C. and with the exclusion of air, said ether component or amine component being added to the reaction mixture during or after the end of the reaction of the alkali metal.

4,229,355

9-DEOXY-9,10-EPOXIDE-DAUNOMYCINONE

Sergio Penco, Viale delle Legioni Romane, 18/4; Fausto Gozzi, Viale Etiopia, 3; Francesco Angelucci, Via Marostica, 29, all of Milan, and Federico Arcamone, Via 4 Novembre, 26, (Milan), all of Italy

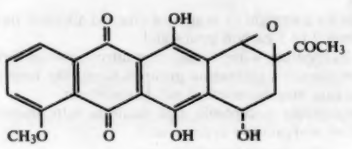
Division of Ser. No. 941,847, Sep. 13, 1978. This application Apr. 27, 1979, Ser. No. 33,995

Claims priority, application Italy, May 9, 1978, 23151 A/78

Int. Cl.² C07D *303/32*

U.S. Cl. 260—348.52 **1 Claim**

1. The compound having the formula:



(XIII)

4,229,356

PRODUCTION OF VITAMIN K_1 AND VITAMIN K_2

Iwao Tabushi, Kyoto; Hiroyuki Sugimoto, and Akira Yazaki, both of Hiroshima, all of Japan, assignors to Wakunaga Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1979, Ser. No. 15,868

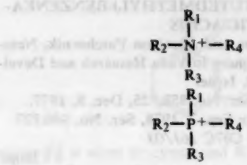
Claims priority, application Japan, Mar. 4, 1978, 53-24057; Mar. 4, 1978, 53-24058

Int. Cl.² C07C *49/62, 39/14*

U.S. Cl. 260—396 K **10 Claims**

1. A process for producing a hydro-precursor for vitamin K_1 or vitamin K_2 which comprises reacting (A) 2-methylhydronaphthoquinone-1,4 with (B) a compound selected from the group consisting of phytyl bromide, isophytyl bromide, geranyl bromide, farnesyl bromide, geranylgeranyl bromide and the corresponding chlorides in a reaction system which comprises an emulsion of (1) an aqueous phase comprising an aqueous solution of an alkali based on an alkali metal and (2) an oily phase comprising a hydrophobic organic solvent which is able to at least partially dissolve said hydro-precursor,

said reaction being carried out in the presence of at least a catalytic quantity of a salt having a quaternary ammonium ion represented by the formula (I) or a tetraalkyl phosphonium ion represented by the formula (II):



(I)

(II)

wherein R_1, R_2, R_3 and R_4 each represent an alkyl or aralkyl group containing from 1 to 20 carbon atoms and the sum of the number of carbon atoms in R_1, R_2, R_3 and R_4 is at least 12, the anion of said salt being a halide, hydrogen sulfate, nitrate or acetate,

said reaction being carried out under conditions which result in production of said hydro-precursor, said hydroprecursor being 2-methylhydronaphthoquinone-1,4 whose 3-position is substituted by phytyl, isophytyl, geranyl, farnesyl or geranylgeranyl.

4,229,357

FLUOROVITAMIN D COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

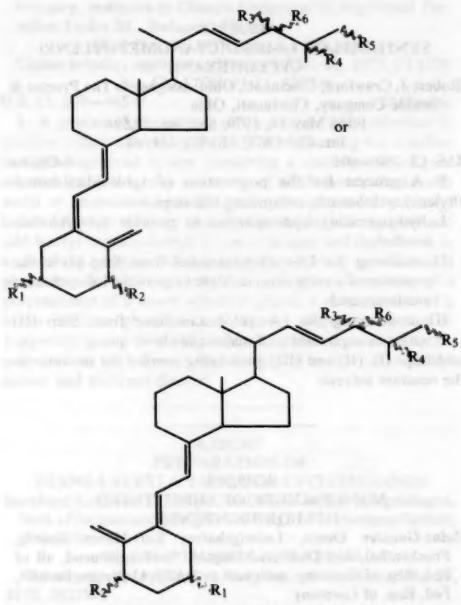
Hector F. DeLuca; Heinrich K. Schnoes; Joseph L. Napoli, Jr., and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 928,279, Jul. 26, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 64,210

Int. Cl.[2] C07J 9/00

U.S. Cl. 260—397.2 **9 Claims**

1. Compounds having the formulae



or

where

R_1 is hydrogen, hydroxy, O-acetyl or O-lower alkyl,

R_2, R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, O-acyl, O-lower alkyl and fluoro, except that at least one of R_2, R_3, R_4, and R_5 must be fluoro, and

R_6 is hydrogen or lower alkyl.

4,229,358

FLUOROVITAMIN D COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

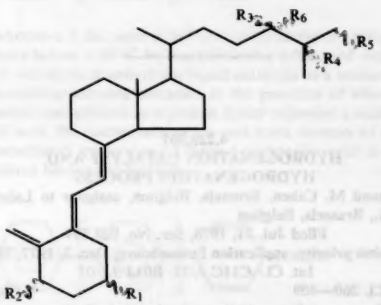
Hector F. DeLuca; Heinrich K. Schnoes; Joseph L. Napoli, Jr., and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 928,279, Jul. 26, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 64,211

Int. Cl.[2] C07J 9/00

U.S. Cl. 260—397.2 **9 Claims**

1. Compounds having the formula



where R_1 is selected from the group consisting of hydrogen, hydroxy, O-acyl and O-lower-alkyl,

R_2, R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, O-acyl, O-lower-alkyl and fluoro, except that at least one of R_2, R_3, R_4, and R_5 must be fluoro, and

R_6 is hydrogen or lower alkyl.

4,229,359

DERIVATIVES OF 25-HYDROXYCHOLECALCIFEROL

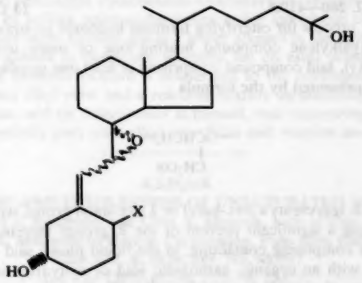
Hector F. DeLuca; Heinrich K. Schnoes; Yoko Tanaka, all of Madison, and Joseph B. Alper, Waunakee, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 4, 1979, Ser. No. 71,973

Int. Cl.[2] C07J 9/00

U.S. Cl. 260—397.2 **2 Claims**

1. Compounds having the formula



where X is a group selected from keto or hydroxy.

4,229,360

PROCESS FOR THE DEHYDRATION OF A COLLOIDAL DISPERSION OF LIPSOMES

Michel Schneider, Grand-Lancy, and Bernard Lamy, Carouge, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Aug. 4, 1978, Ser. No. 931,243

Claims priority, application Switzerland, Aug. 5, 1977, 9615/77

Int. Cl.[3] A23J 7/00; C07F 9/02; C11C 3/00

U.S. Cl. 260—403 5 Claims

1. A process for the dehydration of a colloidal dispersion of liposomes in an aqueous liquid medium, which comprises mixing a hydrophilic compound with the liposome dispersion and dehydrating the mixture to form a stable liposome containing powder which can be stored and reconstituted in an aqueous medium as a liposome dispersion.

4,229,361

HYDROGENATION CATALYST AND HYDROGENATION PROCESS

Raymond M. Cahen, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Jul. 31, 1978, Ser. No. 929,539

Claims priority, application Luxembourg, Dec. 2, 1977, 78622

Int. Cl.[2] C11C 3/12; B01J 31/02

U.S. Cl. 260—409 6 Claims

1. A process for partially and selectively hydrogenating a natural oil which comprises the step of treating said natural oil in the presence of a nitrogen-containing nickel catalyst comprising activated nickel and having incorporated therein by absorption an amount of a nitrogencontaining basic compound equivalent to from about 5 to about 40 atoms of nitrogen per 100 atoms of nickel with hydrogen at a hydrogen pressure and a reaction temperature sufficient to obtain a substantially liquid hydrogenation product rich in monoenic compounds and low in saturated compounds, trans-isomers and conjugated dienes.

4,229,362

ESTERIFICATION PROCESS

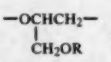
Paula R. Norman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 16, 1979, Ser. No. 30,395

Int. Cl.[3] C09F 5/08; C11C 3/00; C07C 67/02, 69/76

U.S. Cl. 260—410.6 13 Claims

1. A process for esterifying terminal hydroxyl group(s) of a polyoxyalkylene compound bearing one or more terminal hydroxyl, said compound comprising at least one oxyalkylene unit represented by the formula



where R represents a tert.-butyl or a tert.-amyl group, without removing a significant portion of the R groups therein, said process comprising contacting, in the liquid phase, said compound with an organic, carboxylic acid or anhydride in the presence of a small but catalytically effective amount of a Lewis base.

4,229,363

4-HYDROXY-3-(SUBSTITUTEDMETHYL)-BENZENEACETIC ACIDS

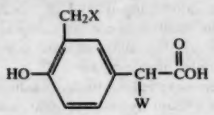
Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziona, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 858,725, Dec. 8, 1977, abandoned. This application Sep. 7, 1978, Ser. No. 940,727

Int. Cl.[2] C07C 161/03

U.S. Cl. 260—454 9 Claims

1. A compound selected from the formula



wherein W is hydrogen; hydroxy; SO_3H or —$COOR_1$ wherein R_1 is selected from hydrogen, phenyl or 5-indanyl, or a 1 to 4 carbon alkyl group; —NHR_2 wherein R_2 is hydrogen, tert-butyloxycarbonyl,

wherein R_3 is hydrogen, a lower alkyl group of from 1 to 4 carbon atoms or a phenyl group; X is an alkoxy group of from 1 to 4 carbon atoms; X is —SCN; or an acceptable salt thereof.

4,229,364

SYNTHESIS OF 1,4-BIS(DICYANOMETHYLENE) CYCLOHEXANE

Robert J. Crawford, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 14, 1979, Ser. No. 38,594

Int. Cl.[3] C07C 120/00, 121/48

U.S. Cl. 260—464 6 Claims

1. A process for the preparation of 1,4-bis(dicyanomethylene)cyclohexane, comprising the steps:

I. hydrogenating hydroquinone to provide 1,4-cyclohexanediol;

II. oxidizing the 1,4-cyclohexanediol from Step (I) in the presence of a ruthenium catalyst to provide 1,4-cyclohexanedione; and

III. condensing the 1,4-cyclohexanedione from Step (II) with two equivalents of malononitrile

said steps (I), (II) and (III) each being carried out in water as the reaction solvent.

4,229,365

MANUFACTURE OF SUBSTITUTED FLUOROBENZENES

Heinz-Guenter Oeser, Ludwigshafen; Karl-Heinz Koenig, Frankenthal, and Dietrich Mangold, Neckargemuend, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

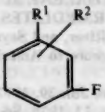
Filed May 22, 1978, Ser. No. 907,912

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724366; May 28, 1977, 2724367

Int. Cl.[2] C07C 121/52, 79/12

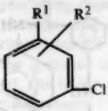
U.S. Cl. 260—465 G 9 Claims

1. A process for the manufacture of a substituted fluorobenzene of the formula



I

where R^1 is nitro or cyano and R^2 is hydrogen, an aliphatic radical or halogen, by reacting a substituted chlorobenzene of the formula



II

where R^1 and R^2 have the above meanings, with potassium fluoride in the presence of a solvent and in the presence of from 0.001 to 0.1 mole of cesium fluoride per mole of starting material II, or in the absence of cesium fluoride and in the presence of an N,N-disubstituted carboxylic acid amide, nitrobenzene, nitrile, aliphatic sulfone and/or aliphatic sulfoxide as the solvent.

4,229,366

PROCESS FOR HETEROGENEOUS NUCLEOPHILIC SUBSTITUTION REACTIONS

Laszlo Töke; Gabor T. Szabo; Gabor Szabo, all of Budapest; Lajos Nagy, Szentendre, and Istvan Rusznak, Budapest, all of Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Terméker Gyára Rt., Budapest, Hungary

Filed Oct. 20, 1978, Ser. No. 953,164

Claims priority, application Hungary, Oct. 20, 1977, CI 1779

Int. Cl.[2] C07C *69/14, 120/04*

U.S. Cl. 260—465 F **11 Claims**

1. A process for carrying out a nucleophilic substitution reaction which comprises the step of conducting the reaction in a heterogeneous system containing a nucleophilic reagent selected from the group consisting of alkali metal, alkali earth metal or ammonium cyanides and carboxylates and a benzyl halide substrate wherein one of said nucleophilic reagent and said benzyl halide substrate is in a solid state and the other is in a dissolved state, a water-immiscible solvent, water, and a phase transfer agent selected from the group consisting of a polymerizate of a lower alkylene glycol, a polymerizate of a lower alkylene glycol with a dilower alkylamine group or 1-piperidyl group terminally substituted thereon, a mixture of a polymerizate of a lower alkylene glycol and a triloweralkyl amine, and mixtures thereof.

4,229,367

PREPARATION OF TRANS-4-ALKYL-CYANOARYLCYCLOHEXANES

Bernhard Granwehr, Zofingen, and René Gnehm, Küngoldingen, both of Switzerland, assignors to Siegfried Aktiengesellschaft, Switzerland

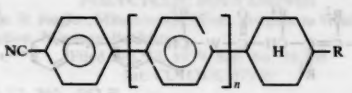
Filed May 15, 1979, Ser. No. 39,134

Claims priority, application Fed. Rep. of Germany, May 23, 1978, 2822504

Int. Cl.[3] C07C *121/64*

U.S. Cl. 260—465 R **10 Claims**

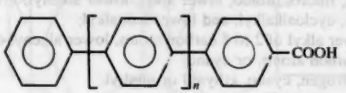
8. Process for the preparation of a stereospecifically substantially pure trans isomer of aryl cyclohexane-4-carboxylic acid alkyl ester useful in the production of a stereospecifically substantially pure trans-4-alkyl-cyanoarylcyclohexane having the formula:



(I)

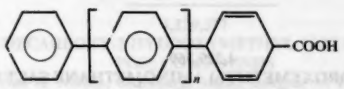
in which R is an unbranched or singly branched alkyl radical of 1 to 12 carbon atoms and n is an integer in the range from 0 to 2, which comprises

(a) hydrogenating an arylcarboxylic acid of the formula:



(II)

wherein n is the same as in Formula (I) above at a temperature below −20° C. by reaction with a solution of sodium or potassium in anhydrous liquid ammonia as a source for providing solvated electrons in the presence of absolute anhydrous ethanol as a proton donor whereby a mixture of both the corresponding cis and trans isomers of aryl substituted cyclohexa-2,5-diene-4-carboxylic acid is obtained having the formula:

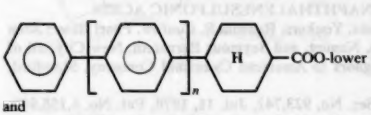


(III)

wherein n is the same as in Formula (I) above, and recovering said mixture of arylcyclohexadiene carboxylic acid isomers having the formula (III);

(b) esterifying said mixture of arylcyclohexadiene carboxylic acid isomers by reaction with a lower alkanol whereby a mixture of the corresponding arylcyclohexadiene carboxylic acid alkyl ester isomers is formed,

(c) hydrogenating the mixed ester isomers with molecular hydrogen in anhydrous lower alkanol in the presence of a Pd/activated carbon catalyst whereby a mixture comprising the corresponding cis and trans isomers of 1-aryl substituted cyclohexane-4-carboxylic acid alkyl ester is formed having the formula:



(IV);

and

(d) heating the mixture of said cis and trans isomers of the aryl substituted cyclohexane-4-carboxylic acid alkyl ester to its boiling point under reflux under anhydrous conditions under an inert gas in a lower alkanol in the presence of sodium or potassium whereby the cis ester present in the isomeric mixture is isomerized to the corresponding trans alkyl ester and a reaction mixture substantially free from said cis ester isomer is formed, and recovering substantially pure trans alkyl ester from said reaction mixture.

4,229,368

ESTERS AND THIOLESTERS OF UNSATURATED ACIDS

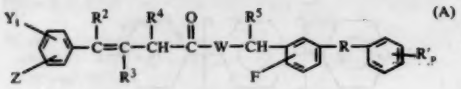
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Jun. 4, 1979, Ser. No. 45,037

Int. Cl.[3] C07C *69/76, 121/70, 153/11*

U.S. Cl. 260—465 D **18 Claims**

1. A compound of the following formula (A):



wherein:

R is oxygen, sulfur, methylene or carbonyl;

R′ is hydrogen, fluoro, bromo, chloro, trifluoromethyl, methyl, methoxy or methylthio;

each of R^2 and R^3 is independently selected from hydrogen, chloro, fluoro, bromo, lower alkyl, lower alkenyl, lower alkoxy, cycloalkalkyl, and lower haloalkyl;

R^4 is lower alkyl of 2 to 5 carbon atoms, lower alkenyl of 2 to 5 carbon atoms, or cyano;

R^5 is hydrogen, cyano, ethynyl or methyl;

W is oxygen or sulfur;

t is zero, one, two, three or four;

Y is independently selected from hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylcarbonyl, lower alkoxycarbonyl, lower acyloxy, halogen, cyano, nitro, and lower haloalkylthio; and

Z is independently selected from the values of Y, cycloalkyl, and lower haloalkoxy; or

Y and Z form a methylenedioxy group.

4,229,369

TRIS (HYDROXYMETHYL) AMINOMETHANE SALT OF 2-MERCAPTOSUCCINIC ACID

Stanley E. Green, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Division of Ser. No. 849,790, Nov. 9, 1977, Pat. No. 4,189,536. This application Apr. 25, 1979, Ser. No. 33,105

Int. Cl.³ C07C *149/20*

U.S. Cl. 260—501.19 **1 Claim**

1. The tris(hydroxymethyl)aminomethane salt of 2-mercaptosuccinic acid.

4,229,370

UREYLENE PHENYLENE ANIONIC NAPHTHALENESULFONIC ACIDS

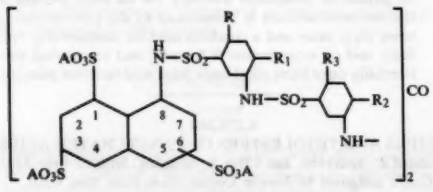
Gerald J. Siuta, Yonkers; Ransom B. Conrow, Pearl River; John F. Poletto, Nanuet, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 923,742, Jul. 11, 1978, Pat. No. 4,155,930. This application Mar. 5, 1979, Ser. No. 17,205

Int. Cl.² C07C *143/30*

U.S. Cl. 260—506 **9 Claims**

1. A compound of the formula:



wherein R, R_1, R_2 and R_3 are selected from the group consisting of hydrogen and methyl; and A is a pharmaceutically acceptable salt cation.

4,229,371

UREYLENE NAPHTHALENE SULFONIC ACID INTERMEDIATES

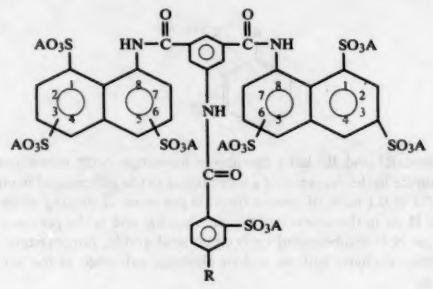
Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 820,276, Jul. 29, 1977, Pat. No. 4,132,730. This application Oct. 13, 1978, Ser. No. 951,414

Int. Cl.² C07C *143/60*

U.S. Cl. 260—507 R **3 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of nitro and amino; and A is selected from the group consisting of alkali metal.

4,229,372

UREYLENE PHENYLENE ANIONIC NAPHTHALENESULFONIC ACIDS

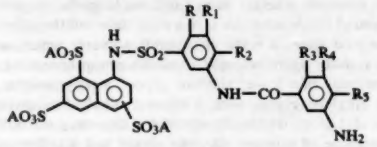
Gerald J. Siuta, Yonkers; Ransom B. Conrow, Pearl River; John F. Poletto, Nanuet, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 923,746, Jul. 11, 1978, Pat. No. 4,155,931. This application Mar. 5, 1979, Ser. No. 17,206

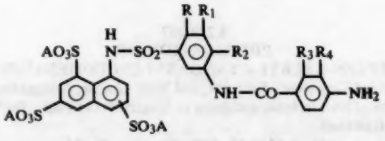
Int. Cl.² C07C *143/30*

U.S. Cl. 260—507 R **8 Claims**

1. A compound of the formulae:



and



wherein R and R_2 are selected from the group consisting of hydrogen and methyl; R_1 and R_4 are selected from the group consisting of hydrogen and —COOB, wherein B is selected from the group consisting of hydrogen and a pharmaceutically acceptable salt cation; R_3 is selected from the group consisting of hydrogen and —SO_3A, wherein A is a pharmaceutically acceptable salt cation; R_5 is selected from the group consisting of hydrogen and methyl; with the proviso that R_1, R_3 and R_4 may not all be hydrogen; with the second proviso that R_2 and

R_5 may not both be hydrogen; with the third proviso that neither phenyl moiety can contain both —SO_3A and —COOB.

4,229,373

PROCESS FOR PRODUCING DIMETHYL FORMAMIDE

Kozo Sano; Hidetaka Kiga, and Takeo Ikarashi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 23, 1979, Ser. No. 41,627
Claims priority, application Japan, Jun. 1, 1978, 53-66151
Int. Cl.³ C07C *102/00, 103/36*
U.S. Cl. 260—561 R **16 Claims**

1. In a process for producing dimethyl formamide by reacting: (a) monomethylamine and trimethylamine, or (b) monomethylamine, trimethylamine and dimethylamine with carbon monoxide in the presence of metallic iron or an iron compound as a catalyst, the improvement comprising adding free water to the reaction system.

4,229,374

AMINE PROCESS USING CU-SN-NA CATALYST

Lynn H. Slaugh, and Galeon W. Schoenthal, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 28,030, Apr. 9, 1979, abandoned, which is a continuation of Ser. No. 844,093, Oct. 17, 1977, abandoned. This application Jun. 28, 1979, Ser. No. 53,119
Int. Cl.³ C07C *85/06, 85/08;* B01J *23/72*
U.S. Cl. 260—563 R **18 Claims**

8. In the process for preparing tertiary amines by reacting aliphatic, cycloaliphatic or araliphatic alcohols, aldehydes or ketones having up to twenty-five carbon atoms with ammonia, primary or secondary amines having from one to eight carbon atoms in a reducing atmosphere at a temperature of from about 160° C. to about 350° C. wherein the alkyl moiety of the alcohol, aldehyde or ketone replaces the hydrogen(s) on the ammonia primary or secondary amine, the improvement which comprises carrying of the reaction in the presence of a catalyst comprising from about 0.05 to about 50 percent by weight of copper, from about 0.05 to about 50 percent by weight of tin and from about 0.003 to about 30 percent by weight of an alkali metal supported on a porous carrier.

4,229,375

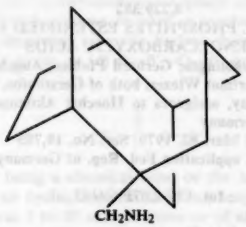
1-AMINOMETHYLTRICYCLO[4.3.1.1^{2,5}]UNDECANE AND ACID-ADDITION SALTS THEREOF

Koji Aigami; Yoshiaki Inamoto; Motoyoshi Ohsugi; Yoshiaki Fujikura, all of Wakayama, and Naotake Takaishi, Sakura, all of Japan, assignors to Kao Soap Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 920,967, Jun. 30, 1978, abandoned. This application Feb. 28, 1979, Ser. No. 15,916
Claims priority, application Japan, Jul. 4, 1977, 52-79752
Int. Cl.² C07C *83/00*
U.S. Cl. 260—563 P **2 Claims**

1. 1-Aminomethyltricyclo[4.3.1.1^{2,5}]undecane represented by the formula (I) and acid-addition salts thereof.

I



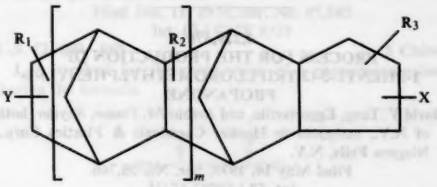
4,229,376

POLYCYCLIC POLYAMINES

Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Sep. 10, 1979, Ser. No. 74,368
Int. Cl.² C07C *87/40*
U.S. Cl. 260—563 P **10 Claims**

1. A polyamine of the formula:



wherein the above formula m is equal to 0 or 1; x and y are selected from the group consisting of:

—CH_2NH_2; —$CH_2NH(CH_2CHR_4CH_2NH_2)$; and

—$CH_2N(CH_2CHR_4CH_2NH_2)_2$, and mixtures thereof,

wherein R_1, R_2, R_3, and R_4 are hydrogen or methyl and mixtures thereof, provided that both x and y may not be CH_2NH_2.

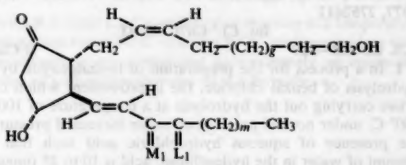
4,229,377

2-DECARBOXY-2-HYDROXYMETHYL-16-FLUORO-PGE$_2$ COMPOUNDS

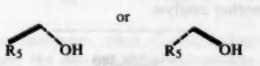
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 786,153, Apr. 6, 1977, Pat. No. 4,139,564, which is a division of Ser. No. 647,369, Jan. 8, 1976, Pat. No. 4,032,576. This application Oct. 13, 1978, Ser. No. 951,096
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.³ C07C *177/00*
U.S. Cl. 568—380 **1 Claim**

1. A prostaglandin analog of the formula



wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein L_1 is

or a mixture of

and

-continued

wherein R_3 and R_4 are hydrogen or fluoro, being the same or different;

wherein g is one, 2, or 3; and

wherein m is one to 5, inclusive:

with the proviso that at least one of R_3 and R_4 is fluoro.

4,229,378

PROCESS FOR THE PRODUCTION OF 1-PHENYL-3-(3-TRIFLUOROMETHYLPHENYL)-2-PROPANONE

David Y. Tang, Eggertsville, and Arthur M. Foster, Snyder, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 14, 1979, Ser. No. 38,766

Int. Cl.³ C07C *45/16*

U.S. Cl. 568—313 **8 Claims**

1. A method of making 1-phenyl-3-(3-trifluoromethylphenyl)-2-propanone comprising the steps of:

(a) condensing 3-trifluoromethylbenzaldehyde with acetophenone under basic conditions to produce a substituted chalcone,

(b) epoxidizing said substituted chalcone to produce the corresponding epoxide,

(c) converting the epoxide to a chlorohydrin,

(d) hydrogenating said chlorohydrin to produce a diol and subsequently converting said diol into the corresponding alcohol, and

(e) oxidizing said alcohol to produce 1-phenyl-3-(3-trifluoromethylphenyl)-2-propanone.

4,229,379

PROCESS FOR THE PREPARATION OF BENZALDEHYDE

Friedrich Brühne, and Karl-August Lipper, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 6, 1978, Ser. No. 958,240

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752612

Int. Cl.³ C07C *45/43*

U.S. Cl. 568—437 **3 Claims**

1. In a process for the preparation of benzaldehyde by the hydrolysis of benzal chloride, the improvement which comprises carrying out the hydrolysis at a temperature of 100° to 200° C. under normal pressure or under increased pressure in the presence of aqueous hydrochloric acid such that the amount of water in the hydrochloric acid is 10 to 25 times the stoichiometric amount required for the saponification of benzal chloride, the hydrochloric acid having a concentration of 10 to 35 percent by weight, the process being carried out in the absence of another catalyst.

4,229,380

PREPARATION OF 3-PHENOXYBENZALDEHYDE

Edgar J. Smutny, and Thomas H. Colby, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 17, 1978, Ser. No. 925,011

Int. Cl.³ C07C *45/42, 45/43*

U.S. Cl. 568—435 **2 Claims**

1. A process for preparing 3-phenoxybenzaldehyde, which comprises adding a mixture of a 3-phenoxybenzyl halide and a 3-phenoxybenzal halide to a mixture of hexamethylenetetramine, water and acetic acid, at a temperature below about 60° C., then heating the resulting mixture over a period of about 30 to 60 minutes to a temperature of about 105° to about 120° C., and maintaining the mixture at that level for a period of from about 3.0 to about 4.5 hours, and separating 3-phenoxybenzaldehyde from the resulting mixture, the amount of water used being from about 5 to about 16 moles per mole of the mixture of halides, the amount of acetic acid used being at least about 3.5 moles per mole of the mixture of halides and the amount of hexamethylenetetramine used being at least 1.7 moles per mole of the 3-phenoxybenzyl halide.

4,229,381

PROCESS FOR PREPARATION OF ALDEHYDES

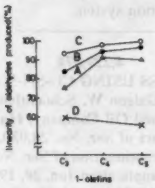
Ikuei Ogata; Yasuziro Kawabata, both of Tokyo; Masato Tanaka, Murayami, and Teruyuki Hayashi, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 9, 1979, Ser. No. 18,879

Claims priority, application Japan, Mar. 9, 1978, 53-26824

Int. Cl.³ C07C *45/08, 45/10*

U.S. Cl. 568—454 **22 Claims**



1. A process for preparing an aldehyde having 3–21 carbon atoms by hydroformylating an olefin having 2–20 carbon atoms, said process comprising contacting said olefin at 40°–200° C. with an amount of an admixture of hydrogen and carbon monoxide effective for forming said aldehyde and under a pressure effective for forming said aldehyde, the molar ratio of hydrogen to carbon monoxide being 0.1 to 10, in the presence of (1) a platinum catalyst, (2) an assistant catalyst selected from the group consisting of halides of metals selected from Group IVb of the periodic table, and (3) a bidentate ligand, said catalyst, said assistant catalyst and said bidentate ligand being present in amounts effective for forming said aldehyde, said bidentate ligand having the general formula:

$$R_2X—Z—Y—Z—XR'_2$$

wherein:

(a) R and R', which may be the same or different, are selected from the group consisting of (i) an alkyl group having 1–12 carbon atoms, (ii) a cycloalkyl group having 6–7 carbon atoms, (iii) an aryl group having 6–10 carbon atoms, and (iv) an aralkyl group having 7–8 carbon atoms;

(b) X is phosphorus, arsenic or antimony;

(c) Y is an alkylene group having 1–3 carbon atoms, a phenylene group, a naphthylene group, or an alicyclic group having a 3- to 6-membered ring, with the proviso that the number of atoms constructing the shortest linkage chain of —Z—Y—Z— inclusive of Y is 3 to 5; and

(d) Z is a methylene group or oxygen.

4,229,382

GLYCEROL PHOSPHITES ESTERIFIED WITH PHENOLCARBOXYLIC ACIDS

Norbert Mayer, Gablingen; Gerhard Pfahler, Augsburg; Franz Scheidl, and Hartmut Wiezer, both of Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

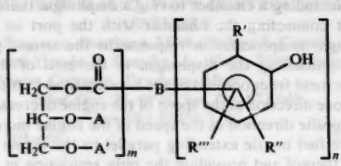
Filed Mar. 12, 1979, Ser. No. 19,785

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811667

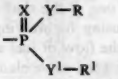
Int. Cl.³ C07F *9/145*

U.S. Cl. 260—930 **3 Claims**

1. Compounds of the formula



in which A and A′ each are a monovalent radical of the structure



or, together, represent a monovalent radical of the structure

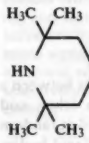
in which radicals

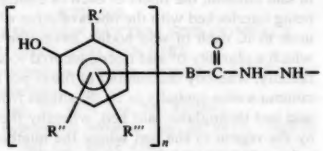
X is oxygen or no substituent;

Y is —O—, —S— or —NR″″—(R″″=H or C_1 to C_{20}-alkyl);

R is a linear alkyl group having from 12 to 30 carbon atoms or, in the case of Y=—O—, alternatively a linear β-hydroxyalkyl group having from 12 to about 30 carbon atoms, or a 3-thia-5-hydroxyalkyl group having from 12 to about 32 carbon atoms, or a mono- or di -C_{12} to C_{30}-fatty acid ester of the dihydroxypropyl radical;

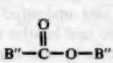
—Y^1—R^1 is either —Y—R or a radical of the structures





R′, R″ and R‴, independently from each other, are H or C_1 to C_4-alkyl;

B is a chemical bond or (a) the radical of a linear or branched, unsubstituted or phenylsubstituted alkane having from 1 to 20 carbon atoms or (b) of an unsubstituted or C_1–C_5-alkylsubstituted cycloaliphatic alkane having from 5 to 12 carbon atoms, or (c) of an unsubstituted or C_1–C_{12}-alkylsubstituted aromatic hydrocarbon having 6 or 10 carbon atoms, or (d) a —B′—O—B″ group, or (e) a



group; B′ being a chemical bond or the radical of a linear, branched or cyclic, unsubstituted or phenylsubstituted alkyl having from 1 to 20 carbon atoms or of an unsubstituted or alkylsubstituted phenyl radical, and B″ being a chemical bond or a linear or branched alkyl radical having from 1 to 6 carbon atoms; and

m and n each are either 1 or 2.

4,229,383

PROCESS FOR THE PREPARATION OF PHOSPHORAMIDATES

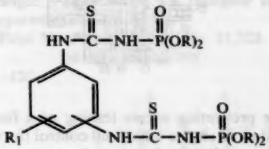
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 11, 1979, Ser. No. 47,543

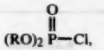
Int. Cl.³ C07F 9/24

U.S. Cl. 260—968 **5 Claims**

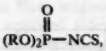
1. A method for the preparation of a phosphoroamidate having the formula:



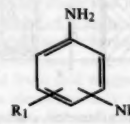
wherein R is alkyl C_1–C_4 and R_1 is hydrogen, alkyl C_1–C_4, halogen or alkoxy C_1–C_4, comprising: reacting a chlorophosphate of the formula:



where R is alkyl C_1–C_4, with approximately an equimolar amount of an alkali metal thiocyanate or ammonium thiocyanate in the presence of a water-immiscible solvent, at a temperature between about 0° and 35° C., to form a cyanatidate of the formula:



wherein R is alkyl C_1–C_4, and further reacting at a temperature ranging from about 20° C. to about 40° C. said cyanatidate with an aqueous mixture comprising approximately an equimolar amount of a phenylenediamine of the formula:



wherein R_1 is hydrogen, alkyl C_1–C_4, halogen or alkoxy C_1–C_4, whereby the desired phosphoroamidate is formed in good yield and purity.

4,229,384

CARBURETOR WITH STARTING MEANS

Kimiji Karino; Masami Nagano, and Masakichi Momono, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed May 9, 1978, Ser. No. 904,323

Claims priority, application Japan, May 13, 1977, 52-54315

Int. Cl.² F02M 1/06

U.S. Cl. 261—39 D **3 Claims**

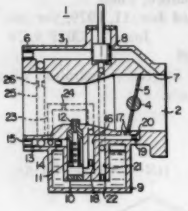
1. A carburetor comprising:

a main suction conduit

a control throttle mounted in said main suction conduit;

a main fuel passage for said main suction conduit;

a main air bleed passage having a main air bleed for said main fuel passage;
a starting suction conduit;
a starting fuel passage for supplying a fuel to said starting suction conduit; and
a valve mounted in said starting suction conduit for controlling intake air;
wherein the improvement comprises:



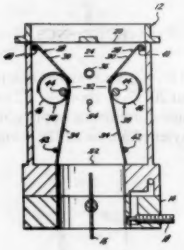
means for preventing excess leaning of a fuel-air mixture supplied to an engine when said control throttle is opened prior to completion of engine warm-up comprising:
a communication passage provided to communicate a portion of said starting suction conduit which is disposed upstream of said valve with a portion of said main air bleed passage which is disposed upstream of said main air bleed.

4,229,385

VARIABLE VENTURI CARBURETOR

Russel B. Leibfreid, P.O. Box 207, Highlands, Tex. 77562

Continuation of Ser. No. 863,175, Dec. 22, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 44,675
Int. Cl.³ F02M 9/10
U.S. Cl. 261—44 H **4 Claims**



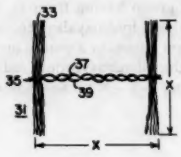
1. A variable venturi carburetor, comrpising a housing having an inlet, an outlet and a passageway therethrough connecting the inlet with the outlet, said passageway including generally parallel end walls, and side walls having first portions which converge from the inlet to a rectangularly shaped throat intermediate the inlet and outlet and second portions which diverge from the throat to the outlet, said first side wall portions being swingable about axes adjacent the inlet and said second side wall portions being swingable about axes adjacent the outlet so as to adjust the size of the throat, a pair of shafts each mounted within the ends of the housing and for rotation about an axis parallel to the axes about which the side wall portions are swingable, and extending within the housing intermediate the outer side of each side wall of the passageway, cams rotatable with the shafts in one direction to move the adjacent ends of the side wall portions toward one another to narrow the throat and in the opposite direction to permit said portions to move away from one another to widen the throat, a port in the end wall of the passageway for sensing pressure therein downstream but immediately adjacent the throat, means including a chamber having a diaphragm therein and a conduit connecting the chamber with the port so that the diaphragm reciprocates in response to the sensed pressure, means connecting the diaphragm to the ends of the shafts which extend from one end of the housing so as to rotate them in said one direction as the speed of the engine decreases and in said opposite direction as the speed of the engine increases, an elongate fuel nozzle extending parallel to the throat just upstream thereof and providing the only restriction in the passageway, a fuel bowl at the other end of the housing, a conduit connecting the fuel bowl with the nozzle, a valve element movable in the connection of the conduit to the bowl for controlling the flow of fuel from the bowl into the conduit, and means on the end of one of the shafts which extends from the other end of the housing for moving the valve element to a position to increase the flow of fuel as the speed of the engine increases and to permit the valve element to move to a position to decrease the flow of fuel as the speed of the engine decreases.

4,229,386

MASS OR HEAT TRANSFER OR SEPARATION OF SOLID OR IMMISCIBLE COMPONENTS FROM FLUIDS

Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238

Continuation-in-part of Ser. No. 480,702, Jun. 19, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,525
Int. Cl.³ B01F 3/04
U.S. Cl. 261—98 **18 Claims**



1. A packed column for mass and/or heat transfer between a gas and a liquid flowing counter-current to each other, said column comprising a bed of fibrous bodies, disposed at random in said column, the fibers of each of contiguous of said bodies being interlocked with the fibers of other of said bodies contiguous to it, each of said bodies having an axial support from which a plurality of said fibers, secured to said support, extend radially, whereby the number of fibers per unit volume of said column varies spatially in all directions from point-to-point of said bed throughout said bed, whereby the liquid is dispersed by the region of the bed where the number of fibers per unit volume is high and flows along the fibers from fiber to fiber where the fibers interlock.

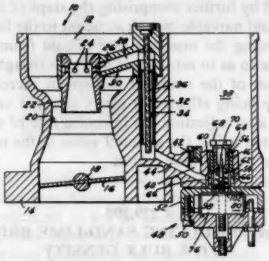
16. The method of separating from a fluid undesired components which comprises conducting said fluid including said components through a bed of bodies, each body comprising an axial support from which bristles extend radially and said bodies being positioned in said bed randomly with the bristles of each of contiguous of said bodies interlocked with the bristles of the others of said bodies contiguous to it, dispersing and deflecting said fluid through said bed and along said bristles thus initially causing said undesired components of smaller dimensions to adhere to said bristles and deposit substantially uniformly on said bristles, by said dispersion and deflection of said fluid along said bristles also inducing agglomeration and coalescence of said undesired components to form aggregates of said undesired components, depositing said aggregates on the downstream sides of said bristles, and disposing of the resulting fluid after passing it through said bed.

4,229,387

CARBURETOR FUEL FLOW CONTROL VALVE ASSEMBLY

Jerry B. Rogerson, Dearborn, Mich.; Robert F. Connin, Toledo, Ohio, and Harold E. Benedix, Jr., Troy, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,049
Int. Cl.[3] F02M 7/20
U.S. Cl. 261—66 3 Claims



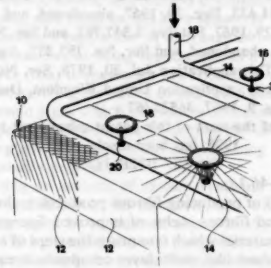
1. An electro-mechanical cartridge type fuel flow control valve assembly for attachment to the float bowl of a carburetor for projection of the valve portion thereof into the carburetor float bowl, comprising, in combination, a unitary assembly consisting of an outer housing having an upstanding fuel well open at the top to the fuel in the float bowl and having an opening adjacent its other lower end connected to the carburetor main fuel supply line for the flow of fuel therebetween at all times, a removable fuel metering flow control orifice means integral with the well between the openings, a fuel metering needle type valve mounted in the orifice means for an axial transitory movement relative thereto to selectively control fuel flow volume from the bowl to the main supply line, a reversible electrical stepper motor fixedly received in an integral manner within the housing and having a central core surrounding and threadedly engaging the needle valve for moving the valve axially in discrete steps as a function of electrical impulse input signals to the stepper motor rotating the motor, and electrical connection means to connect the stepper motor to a selectively operable, selective impulse type source of electrical energy.

4,229,388

LIQUID DISTRIBUTION SYSTEM FOR CONTACT BODIES AND THE LIKE

Håkan Lignell, Handelsvägen, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Aug. 22, 1978, Ser. No. 935,862
Claims priority, application Sweden, Aug. 31, 1977, 7709810
Int. Cl.[3] B01F 3/04
U.S. Cl. 261—111 7 Claims



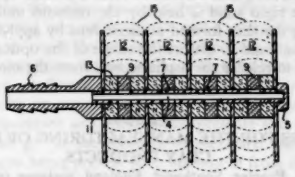
1. A spraying system for the distribution of liquid over the upper surface of a contact bed which is formed of a plurality of thin layers of vertically positioned folded and corrugated sheet material that is adapted to promote contact between said liquid and a gas flowing through said bed, said system comprising in combination with said bed at least one liquid distribution pipe seated on and supported by the upper layers of said bed defined by the upper edges of said layers of sheet material and having at least one liquid flow opening in the top thereof and a deflector plate positioned above said opening and having a generally conical lower surface confronting said liquid flow opening to promote distribution of said liquid over said surface of said bed.

4,229,389

GAS DIFFUSER, AERATOR, OR SPARGER APPARATUS

Steven T. Granger, Falls Church, Va., assignor to Thompson Marine Corporation, Arlington, Va.

Filed Mar. 16, 1979, Ser. No. 21,323
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—122 10 Claims



1. A diffuser for discharging gas into a body of liquid comprising, in combination, a first gas chamber, inlet means for gas in communication with the interior of said gas chamber, outlet means for gas from said chamber comprising at least one perforation located in an end wall of said chamber opposite said inlet means, a second magnetic chamber defined by spaced apart opposed sidewalls made of material magnetizable or conductive to lines of magnetic flux, magnetic means for inducing magnetic poles in said opposed sidewalls of said magnetic chamber and constructed and arranged to provide essentially horizontal magnetic flux lines across the upper portion of said magnetic chamber, the sidewalls of said magnetic chamber being constructed and arranged so that gas from said gas chamber perforation is discharged into said magnetic chamber between said sidewalls at an open bottom of said magnetic chamber and permitted to rise and leave said chamber through an open top of said chamber when said diffuser apparatus is located beneath the surface of a body of liquid, the sidewalls being further constructed and arranged to permit liquid from said liquid body to enter said magnetic chamber to replace liquid vertically lifted from said magnetic chamber and intersectingsaid flux lines simultaneously with the gas vertically lifing the liquid and also intersecting said magnetic flux lines.

4,229,390

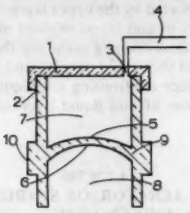
METHOD OF MAKING CAST ASPHERIC LENSES

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 5,598, Jan. 22, 1979, Pat. No. 4,188,353. This application Jul. 16, 1979, Ser. No. 58,027
Int. Cl.[3] B29D 11/00
U.S. Cl. 264—1 1 Claim

1. A method of casting and removing from a resinous lens mold an aspheric optical lens of polymeric material, said mold of resinous material having at one end a cup-like molding cavity with a spherical optical surface and at the other end an opening, heating the resinous mold to a working temperature below the glass transition temperature of the resinous mold material, applying sufficient air pressure against the optical surface to change the spherical optical surface to an aspheric optical surface, allowing the resinous mold to cool before

removing the applied air pressure, casting a liquid monomer in the molding cavity, polymerizing the monomer to form a rigid solid, having a first aspheric optical surface adhering to the aspheric optical surface of the resinous mold with sufficient adhesive strength to allow cutting and polishing of a second



optical surface, cutting and polishing on the side opposite the first aspheric optical surface to form a second optical surface while the rigid solid is held by the resinous mold, and then removing the thus formed aspheric lens by applying pressure against the mold to distort the shape of the optical surface of the mold to release the aspheric lens from the mold.

4,229,391

PROCESS FOR THE MANUFACTURING OF COLORED CLAY PRODUCTS

James W. Procter, Southport, England, assignor to Ravenhead Brick Company Limited, Tyne and Ware, England

Filed Dec. 21, 1977, Ser. No. 862,788

Claims priority, application United Kingdom, Dec. 22, 1976, 53596/76

Int. Cl.[2] C04B *35/56*

U.S. Cl. 264—29.5 **15 Claims**

1. A process for the production of colored, fired, shaped clay products which comprises firing shaped, dried, iron-containing clay objects in a kiln, depositing carbon on and into the resulting fired clay objects by heat treating the said fired objects in a carbon-containing atmosphere to produce a colored, fired, shaped clay product and thereafter cooling said colored product in an atmosphere of nitrogen to prevent loss or reduction of the color produced by the carbon deposition step.

4,229,392

PROCESS OF PRODUCING A FOAMED PLASTIC INSULATED CONDUCTOR AND AN APPARATUS THEREFOR

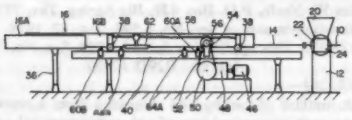
Takashi Shimano; Yoshimasa Masukata, and Hiromitsu Sato, all of Ichihara, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,215

Claims priority, application Japan, Feb. 28, 1978, 53/22551

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—40.1 **8 Claims**



1. A process of producing a foamed plastic insulated conductor comprising the steps of injecting a foaming gas into a molten resin in an extruder; extruding an insulation of said molten resin on a conductor wire travelling through a head of said extruder, said insulation extruded out of said head being foamed to form a foamed plastic insulated conductor; passing said foamed plastic insulated conductor through cooling trough means including a movable trough which is movable axially of said foamed plastic insulated conductor toward and away from said head of said extruder in a range of movement between first and second limit positions; detecting a value of a capacitance of said foamed plastic insulated conductor by means of a capacitance monitor; and when there is a difference between the detected value and the specified capacitance for said foamed plastic insulated conductor, adjusting the position of said movable trough so as to correct said detected value of said capacitance to that of said specified capacitance thereof, characterized by further comprising the steps of detecting the positions of said movable trough adjacent to the limit positions thereof; adjusting the injection rate of said foaming gas to a selected value so as to return said movable trough toward the middle portion of the range of movement thereof; said rate adjusting step being effected at every selected value thereof, and wherein after adjusting the injection rate of said foaming gas to a selected value, the selected value of the injection rate is retained for a given time period.

4,229,393

METHOD OF PRODUCING SAND-LIME BRICKS WITH A LOW BULK DENSITY

Karlhans Wesche, Lohmühlenstrasse 5a; Peter H. Schubert, Königshügel 34, and Horst W. Glitza, Westend 15, all ofAachen, Fed. Rep. of Germany (5100)

Continuation of Ser. No. 692,747, Jun. 4, 1976, abandoned. This application Aug. 22, 1978, Ser. No. 935,758

Int. Cl.[2] C04B *35/14*

U.S. Cl. 264—42 **15 Claims**

1. A method for producing a sand-lime building brick of low bulk density comprising the steps of:

(a) preparing a mixture of sand, lime, water and cement, said mixture consisting essentially of sand, lime and water and also including a relatively small amount of cement as a binder, said cement being present in relatively small amount in relation to the total amount of said sand, lime and water, said cement being present in an amount in excess of 1% by weight to provide said mixture with a green strength of at least 1 kg/cm^2 subsequent to compaction of said mixture;

(b) compacting said mixture in a mold at a pressure of less than 150 kg/cm^2 to form green brick;

(c) removing said green brick from said mold;

(d) transporting said green brick to an autoclave; and

(e) curing said green brick in the autoclave to form said building brick.

4,229,394

MULTI-LAYER PRODUCTS

Ole-Bendt Rasmussen, Topstykket 7, 3460 Birkerod, Denmark

Division of Ser. No. 607,695, Aug. 25, 1975, Pat. No. 4,125,581, which is a continuation of Ser. No. 421,270, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 75,229, Sep. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,688, Nov. 19, 1969, abandoned, which is a continuation of Ser. No. 694,433, Dec. 29, 1967, abandoned, and Ser. No. 694,660, Dec. 29, 1967, Pat. No. 3,547,761, and Ser. No. 751,205, Aug. 8, 1968, abandoned, and Ser. No. 757,237, Aug. 8, 1968, abandoned. This application Jul. 20, 1978, Ser. No. 926,244

Claims priority, application United Kingdom, Dec. 30, 1966, 58429/66; Aug. 9, 1967, 36531/67

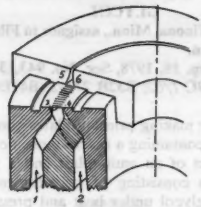
The portion of the term of this patent subsequent to Nov. 14, 1995, has been disclaimed.

Int. Cl.[2] B32B *31/30*

U.S. Cl. 264—46.1 **14 Claims**

1. A method of producing fibrous products, including single fibers, yarn and fibrous webs, of improved fineness from extruded sheet material which comprises the steps of extruding in the form of a sheet-like, multi-layer composite stream a plurality of extrudable materials, at least one of which is a synthetic thermoplastic fiber-forming polymer and another of which is

expandable or swellable, said layers extending generally parallel to the faces of said stream, some of such layers containing said fiber-forming polymer and others said expandable or swellable extrudable material with the different layers being interspersed in said composite stream, solidifying said compos-



ite stream into a multi-layer sheet, subjecting the multi-layer sheet not earlier than during such solidification to a swelling or expanding treatment to aid in its mechanical disruption, and then mechanically disrupting the swollen or expanded sheet to produce a fibrous product of increased fineness.

4,229,395

METHOD FOR INJECTION MOLDING THICK-WALLED ARTICLES

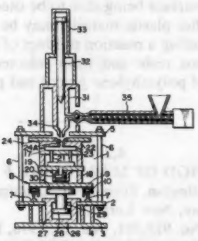
Tadashi Nagumo, Kamakura; Akio Yasuike, Yokohama, and Hiroshi Kataoka, Tokyo, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 776,886, Mar. 11, 1977, abandoned. This application Jun. 23, 1978, Ser. No. 918,694

Claims priority, application Japan, Mar. 13, 1976, 51-27447; May 17, 1978, 53-57513

Int. Cl.[2] B29D *27/00*; B29F *1/06*

U.S. Cl. 264—51 **3 Claims**



1. A method for the production of foamed articles having an average wall thickness of between 3.5 mm and 100 mm by injecting a molten synthetic resin material with a foaming agent contained therein from an injection cylinder means into a cavity of a mold means, said method comprising the steps of:

(a) clamping said mold means by a relatively low clamping force having a coefficient in the range of between 10 and 40, said coefficient being represented as a ratio of clamping force (ton) to maximum injection shot volume (liter);

(b) pre-pressurizing the cavity of said mold means by supplying thereto a gas which has such a pressure at least above 3 kg per square centimeter so that the diffusion of the blowing gas produced from said foaming agent will be substantially prevented;

(c) injecting an amount of molten synthetic resin material that is insufficient to fill the cavity and which contains a foaming agent in an amount about 0.05% by weight to about 5% by weight into said pre-pressurized cavity from the injection cylinder means for a predetermined time in the range of between 3 and 20 seconds;

(d) releasing said pressurized gas from said mold cavity no earlier than immediately before completing said injection step for expanding the injected foamable resin material to fill said mold cavity; and

(e) cooling said mold means at least during said injection step.

4,229,396

METHOD OF EXTRUDING THERMOPLASTIC RESIN FOAMS HAVING ENLARGED CELL-SIZES

Kyung W. Suh, Granville, Ohio, and Charles R. Amos, Auburn, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1979, Ser. No. 22,579

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—53 **6 Claims**

1. A process for the preparation of a synthetic resinous thermoplastic extruded foam wherein a heat-plastified synthetic resinous gel containing a volatile fluid foaming agent, the gel being at a foaming temperature, the gel at the foaming temperature being expressed from a die into a region of reduced pressure, the reduced pressure being sufficient to permit the gel to expand into cellular form and cooling the gel to a temperature at which the gel is self-supporting, the improvement which comprises incorporating within the heat-plastified unfoamed gel, a cell-size enlarging agent, the cell-size enlarging agent being an organic compound which is liquid at the foaming temperature and atmospheric pressure and generally soluble in the gel at the foaming temperature, the cell-size enlarging agent being present in an amount of from about 0.01 to 5 parts by weight per hundred based on the weight of the thermoplastic resin in the foamable gel.

4,229,397

METHOD FOR FORMING FIBER-REINFORCED COMPOSITE MATERIAL

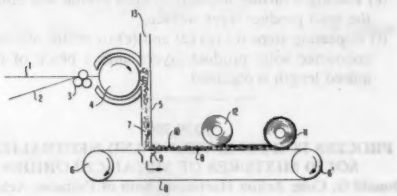
Kenji Fukuta, Yokohama; Ryuzo Ono-Oka, Kanagawa; Masatoshi Yoshida; Kazuhisa Saito, both of Mishima, and Hiroyuki Kosuda, Numazu, all of Japan, assignors to Agency of Industrial Science & Technology and Toho Beslon Co., Ltd., both of Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,634

Claims priority, application Japan, Dec. 10, 1976, 51-148561

Int. Cl.[3] D04H *1/16*

U.S. Cl. 264—113 **26 Claims**



1. A method for producing a uniformly mixed fibrous mat, comprising:

(a) supplying to a rotating rotor which has projections on the surface thereof

(i) at least one continuous high tensile modulus reinforcing fibrous material, with

(ii) at least one pre-cut thermoplastic fibrous material,

(iii) wherein said thermoplastic fibrous material has a lower melting or softening point than the temperature at which the reinforcing fibrous material melts or is damaged, and said reinforcing fibrous material has a lower ultimate elongation than the thermoplastic fibrous material,

to thereby cut said continuous reinforcing fibrous material, and pluck said pre-cut thermoplastic fibrous material,

(b) dispersing said reinforcing fibrous material and said

thermoplastic fibrous material into an air flow in a slit by centrifugal force and by the air flow produced by the rotation of the rotor, to thereby mix said fibrous materials uniformly,

(c) collecting the mixed fibrous materials together on a continuously moving net and applying a vacuum beneath the net to yield said uniformly mixed fibrous mat.

4,229,398

METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF A BLOCK OF RECONSTITUTED FOAM MATERIAL

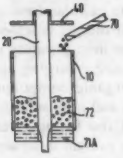
Richard G. Harvey, Buckinghamshire, England, assignor to Dunlop Limited, London, England

Filed Feb. 23, 1979, Ser. No. 14,616

Claims priority, application United Kingdom, Mar. 3, 1978, 8483/78

Int. Cl.[2] **B29C** *29/00;* **B29D** *27/00*

U.S. Cl. 264—113 **7 Claims**



1. A method for the continuous stepwise production of a cylindrical block of reconstituted foam material from foam crumb comprising:

(a) Placing in an open-ended moulding cavity a mixture of foam crumb and a binder compatible with said mixture;

(b) Compressing the mixture to a height of about 1 foot;

(c) Heating the mixture to cure the binder and form a solid product layer;

(d) Lowering said solid product layer from the moulding cavity and supporting said solid product layer relative to the cavity to provide a solid product layer surface at one end of said cavity for the reception of and binding to of a further mixture of foam crumb and binder;

(e) Placing a further mixture of foam crumb and binder on the solid product layer surface;

(f) Repeating steps (b) (c) (d) and (e) to create successively connected solid product layers until a block of the required length is obtained.

4,229,399

PROCESS FOR PELLETIZING AND NEUTRALIZING SOLID MIXTURES OF METAL CHLORIDES

Donald G. Cole; Achim Hartmann, both of Pulheim; Achim M. Kulling, and Hermann B. Trüb, both of Leverkusen, all of Fed. Rep. of Germany, assignors to NL Industries, Inc., New York, N.Y.

Filed Aug. 10, 1978, Ser. No. 932,551

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736622

Int. Cl.[3] **C09C** *1/28*

U.S. Cl. 264—117 **5 Claims**

1. A process for treating a solid mixture containing chlorides of iron, vanadium and chromium, obtained in the chlorination of titaniferous raw materials which comprises forming a granulate by mixing in a dry state said solid mixture with an alkaline reacting substance selected from the group consisting of calcium oxide, calcium hydroxide, calcium carbonate, and mixtures thereof, whereby the chlorides of vanadium and chromium form compounds substantially insoluble in water, and thereafter granulating the resulting mixture by adding water at a quantity of 35 to 70 percent by weight, and forming pellets thereof.

4,229,400

MOLD COMPONENT COMPRISING A MAT IMPREGNATED WITH A REACTION PRODUCT OF AN AMINOPLAST RESIN AND A POLYALKYLENE GLYCOL

William A. Laurie, Winona, Minn., assignor to Fiberite Corporation, Winona, Minn.

Filed Sep. 18, 1978, Ser. No. 943,133

Int. Cl.[2] **B29C** *1/02;* **B32B** *27/42;* **B41D** *3/00*

U.S. Cl. 264—225 **19 Claims**

1. The method for making printing plates comprising,

forming a carrier containing a reactive resin comprising the reaction product of an aminoplast and a resin selected from the group consisting of polyethylene glycol and polypropylene glycol under heat and pressure against a master printing plate so as to produce a cured negative of said master printing plate,

inserting said cured negative into a molding device so as to provide a mold insert therein, and

flowing a plastic material against said molded negative insert and curing said plastic to produce a copy of said master printing plate.

6. A negative printing plate against which a plastic material may be molded under heat and pressure to produce a positive printing plate comprising a reaction product of an aminoplast and a resin selected from the group consisting of polyethylene glycol and polypropylene glycol in a cured condition on a carrier therefor.

8. A printing plate matrix capable of being shaped under heat and pressure and then being used as a part of a mold for imparting a portion of its shape to a plastic material under heat and pressure comprising,

a carrier having a porous characteristic, and

a curable resin carried by said carrier capable of receiving very sharply defined impressions upon molding and being cured, said surface being able to be used as a mold against which another plastic material may be shaped,

said resin including a reaction product of the components of an aminoplast resin and resin selected from the group consisting of polyethylene glycol and polypropylene glycol.

4,229,401

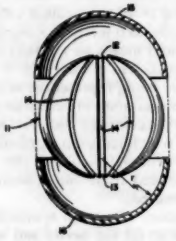
METHOD OF MAKING GOLF BALLS

Terence W. Pocklington, Tupelo, Miss., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 919,381, Jun. 26, 1978, Pat. No. 4,173,345. This application May 29, 1979, Ser. No. 43,014

Int. Cl.[2] **B29C** *27/18*

U.S. Cl. 264—248 **5 Claims**



1. A method of making a golf ball comprising the steps of providing a preformed homogeneous spherical core of elastomeric material having a multiplicity of relatively shallow surface channels all lying on the paths of great circles passing

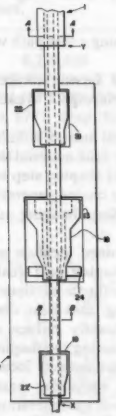
through opposite poles on said core surface and compression molding preformed hemispherical cover shells of thermoplastic or thermoformable material upon and about said core under heat and pressure, said shells being substantially centered with said poles as they are brought together to integrally weld around a generally transverse equatorial seam.

4,229,402

FIBER OPTIC CONNECTION METHOD

Carl A. Villarruel, Alexandria, and Thomas G. Giallorenzi, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1978, Ser. No. 925,727
Int. Cl.[3] B29H 9/12; B32B 31/06
U.S. Cl. 264—262 1 Claim



1. A method for attaching a connector to an optical fiber having a plastic-covered optical core, said connector having an inside diameter which is slightly smaller than the diameter of the covered core of the fiber and slightly greater than the diameter of the core alone, said method comprising the steps of:

forming a section of fiber containing only the fiber core;

forming an adjoining section of fiber containing the core and its covering;

threading the core of the fiber through said connector until the fiber is stopped at the covered section;

placing the fiber and connector in an attachment means so that the fiber is retained centrally of the connector and in a substantially straight position;

heating the connector so that the covering is softened;

extruding the softened covered fiber through the connector so that the softened covering extends at least to the far end of the connector opposite to that at which it was stopped and fills the space between the core and the connector wall;

allowing the covering to cool off;

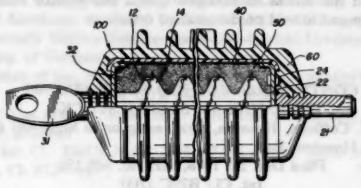
cutting off the fiber flush with the far end of the connector.

4,229,403

METHOD OF ASSEMBLING A FAULT LIMITER BY MOLDING A RIGID HOUSING ABOUT A NON-RIGID SUBASSEMBLY

John E. Guleserian, Prairie View, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Feb. 1, 1979, Ser. No. 8,424
Int. Cl.[3] B29C 6/04
U.S. Cl. 264—263 8 Claims



2. An improved method of manufacturing a fault limiter wherein a fuse assembly composed of a fusible element on an element support member and connected between two terminal assemblies is sealed in a rigid insulating housing, the improvement comprising:

surrounding the fuse assembly, except for a portion of each terminal assembly with an electrically non-conductive, flexible container having an opening therethrough;

filling the flexible container with a pulverulent arc-quenching material free of any binder through the opening;

closing the opening; and

molding an insulating material around the container, except for the terminal assembly portions, and compacting the arc-quenching material, said insulating material being of a composition which contracts as it cures to compact the arc-quenching material.

4,229,404

METHOD FOR DRAWING YARN

Charles S. Hatcher, Greenville, S.C., and Kenneth E. Smith, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 412,656, Nov. 5, 1973, abandoned. This application Apr. 28, 1978, Ser. No. 901,034
Int. Cl.[2] B29C 17/02
U.S. Cl. 264—290.5 8 Claims

1. A method for cold drawing a plurality of yarns comprising:

(a) withdrawing said yarns from an equal number of supply sources by winding said yarns about driven feed roll means in parallel spaced relationship with one another and in a predetermined order;

(b) advancing said yarns in a single, normal plane deter-

mined by the surface of said feed roll means and in said predetermined order;

(c) urging said yarns into a concave arc whose tangent at the midpoint of said arc forms an angle of approximately 45° with said normal plane, whereby said yarns are urged into substantial contiguous side-by-side relationship and maintained in said predetermined order; and

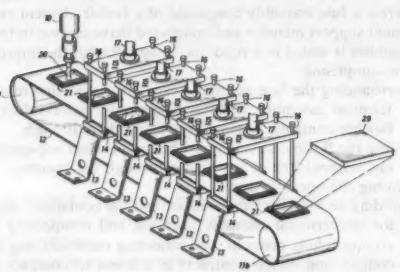
(d) stretching said yarns by winding said yarns about draw roll means, driven at a speed greater than the speed of said feed roll means, in said contiguous side-by-side relationship and in said predetermined order.

4,229,405

CONTINUOUS METHOD FOR FORMING THERMOPLASTIC SLAB STOCK

Paul M. Coffman, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 11, 1978, Ser. No. 968,250
Int. Cl.[2] B29C *3/00*
U.S. Cl. 264—313 **5 Claims**



1. A continuous method for forming thermoplastic polymer slabs which comprises:

providing a multiplicity of deformable heat insulating mold rings; a polymer melt dispensing means; a continuous heat-transmitting movable belt; multiple compression and heat exchange stations, each comprising a lower platen adapted to support a mold ring resting on said belt and an upper platen adapted to place said mold ring and its contents under mechanical pressure; and

forming said polymer slabs by moving said belt at staged intervals to successively:

a. fill a mold ring from said melt dispensing means while the ring is resting on said belt;

b. place said filled mold ring under compression between heated platens at at least one station;

c. subsequently placing said filled mold ring under compression between cooled platens at a multiplicity of cooling stations; and

d. removing the cooled molded article, sufficiently solidified to maintain its shape, from the mold after it leaves the last of said cooling stations.

4,229,406

METHOD FOR PREPARING AN EMBOSSED FOAMED LATEX SHEET

Richard Pollock, Grangemouth, Scotland, assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 525,796, Nov. 21, 1974, abandoned. This application Jan. 22, 1979, Ser. No. 5,109
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—321 **3 Claims**

1. A method for preparing embossed foam latex sheet consisting of a foamed styrene-butadiene elastomer latex having dispersed therein from 25 to 100 parts per hundred parts of latex solids of a powdered particulate solid having a softening temperature in the range 90°–200° C., said method comprising:

heating said foamed latex sheet to a temperature sufficient to soften the particulate solid; and

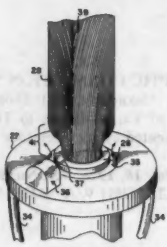
contacting said heated foamed latex sheet with a cold embossing roll to depress the foam and solidify the particulate solid.

4,229,407

TEAR PATH PRODUCTS, METHOD AND APPARATUS

Brian W. Craig, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 23, 1979, Ser. No. 14,702
Int. Cl.[3] B29F *3/08*
U.S. Cl. 264—519 **12 Claims**



1. A method of forming a tear path within a molded material, comprising:

selecting a material having molecular chains capable of being oriented with respect to each other as the material is solidifying;

shaping said material into a solidified form, said shaping including cooling said material and reorienting said molecular chains, said shaping step including initially orienting said molecular chains generally axially and said reorienting step including changing said generally axial orientation; and

treating a predetermined location on said solidifying material during such shaping, said treating step including dissipating heat at a rate faster than the rate at which said material is cooling, said heat dissipating rate being fast enough to significantly reduce said reorienting of the molecular chains during the shaping step to establish a tear path at said predetermined location, said treating step including rapidly extracting heat from said solidifying material when it is at a temperature between its frost point and the temperature at which the material is molten, said heat dissipating step including touching the surface of said material with a highly thermally conductive narrow contact area.

4,229,408

METHOD AND COMPOSITION FOR TOILET HOLDING TANK

James D. Bennett, Arlington; Jimmy R. Coolidge, and Clifford E. Murphy, both of Fort Worth, all of Tex., assignors to CBM Enterprises, Inc., Arlington, Tex.

Filed Apr. 30, 1979, Ser. No. 34,608
Int. Cl.[2] A61L *13/02, 1/00, 13/00*
U.S. Cl. 422—5 **11 Claims**

1. A method of controlling odor emission from a toilet system in a toilet holding tank for a prolonged interval of 48 hours and more consisting essentially of adding to the toilet holding tank an effective amount of an additive composition consisting essentially of:

a. a quaternary compound selected from the group consisting of alkyl dimethyl benzyl ammonium chlorides and alkyl diethyl benzyl ammonium chlorides, where the alkyl group contains 12 to 18 carbon atoms, inclusive;

b. formaldehyde; and

c. an acid buffer in sufficient concentration to buffer said additive composition in the toilet system to a pH in the range of 4–5;

said effective amount being that which is sufficient to maintain a concentration of at least one hundred parts per million of said additive composition throughout the prolonged interval.

4,229,409

METHOD OF INHIBITING CORROSION OF ALUMINUM WITH 2-PHOSPHONO-BUTANE-1,2,4-TRICARBOXYLIC ACID

Rolf Scharf, Monheim; Hans-Joachim Schlüssler, Haan, and Friedrich Staschkiewicz, Monheim-Baumberg, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 862,676, Dec. 21, 1977, abandoned. This application Nov. 2, 1978, Ser. No. 956,897

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658475

Int. Cl.[2] C23F *11/06, 11/16*

U.S. Cl. 422—13 **6 Claims**

1. A method for inhibiting the corrosion of aluminum in contact with aqueous alkaline solutions having a pH at 20° C. of from 10 to 14 consisting essentially of adding to the aqueous alkaline solution in contact with aluminum from 0.05 to 0.4 gm per liter of a corrosion inhibitor selected from the group consisting of 2-phosphono-butane-1,2,4-tricarboxylic acid and water-soluble salts thereof.

4,229,410

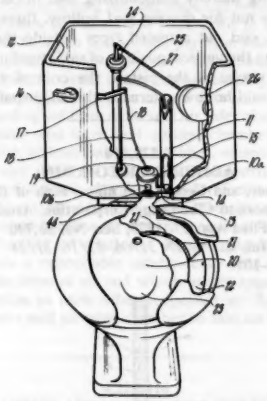
BACTERIOSTATIC DEODORANT WATER COLORING TOILET ELEMENT

Carl M. Kosti, P.O. Box 1777, Troy, Mich. 48084

Filed Feb. 13, 1978, Ser. No. 877,373

Int. Cl.[2] A61L *9/00, 13/00*; E03D *9/02*

U.S. Cl. 422—28 **4 Claims**



1. A method of disinfecting the water in a toilet, said toilet having a water tank, a bowl, and a drain connecting said tank to said bowl, water passing through said drain during flushing only, said drain having an upright drain tube through which water passes during flushing only, said method comprising the steps of:

disposing in said drain a formed, water soluble toilet element comprising a binding agent and an effectie amount of bacteriostatic agent;

positioning in said drain a mesh drain basket, said mesh basket being adapted to allow water with dissolved toilet element to pass into said bowl but to otherwise prevent said formed toilet element from passing into said bowl, whereby the water passing into said bowl is treated but said water soluble element is conserved by dispersing only during flushing; and

introducing said bacteriostatic agent into said bowl during flushing only.

4,229,411

PROCESS AND APPARATUS FOR THE ABSORPTIVE REMOVAL OF POLLUTANTS FROM WASTE GASES

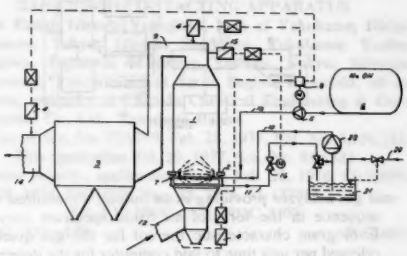
Theodor Kisters, and Alfred Vogler, both of Krefeld, Fed. Rep. of Germany, assignors to Babcock-BSH Aktiengesellschaft vormals Büttner-Schilde-Haas AG, Krefeld-Uerdingen, Fed. Rep. of Germany

Division of Ser. No. 939,373, Sep. 5, 1978. This application Apr. 10, 1979, Ser. No. 28,927

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739509

Int. Cl.[3] G01N *21/00*; G05D *7/00, 23/00*; B01D *50/00*

U.S. Cl. 422—62 **7 Claims**



1. An apparatus for purging by absorption pollutants from waste gases, which comprises: absorption vessel means; inlet duct means communicating with the bottom of said absorption vessel means; means for passing a dispersion or aqueous suspension or solution of a neutralizing agent and additional fresh water into said absorption vessel means; recycle duct means for recycling condensed or excess water from said absorption vessel means into said passing means; an electrofilter disposed following said absorption vessel means; additional duct means communicating with the top of and connecting said absorption means with said electrofilter; means connected to said inlet duct means, for automatically and continuously measuring the concentration of pollutants in the waste gas and adjusting the amount of neutralizing agent according to the measurements; discharge duct means for the release of purified gas from said electrofilter; means connected to said additional duct means; for automatically and continuously measuring the temperature of the gas discharged from said absorption vessel means, and valve means disposed in said recycle duct means, controlled by said temperature measuring means, so as to adjust the amount of recycled water and thereby maintain a constant temperature in said absorption vessel means.

4,229,412

APPARATUS FOR THE DETERMINATION OF BOND FORMS OF GASES

Kurt Orths; Roland Prumbaum, both of Ratingen, and Peter Berger, Düsseldorf-Benrath, all of Fed. Rep. of Germany, assignors to Ströhlein GmbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 969,004

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755587

Int. Cl.[3] G01N *31/12, 33/20*

U.S. Cl. 422—80 **7 Claims**

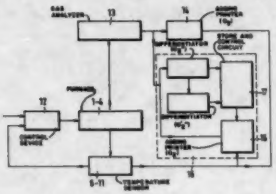
1. Apparatus for the determination of bond forms of gases,

such as a sample containing oxygen or nitrogen in solid or liquid small metal samples e.g. from 0.8 to 1.2 g comprising:

a furnace for heating the sample continuously to elevate the temperature thereof to a temperature of about 3000° C. maximum in less than five minutes to release gases from the sample, said furnace comprising a control device for presetting a constant heating rate of the sample for the constant heating thereof at a value between 20° C./sec and 350° C./sec,

a gas analyzer operatively coupled to said furnace from which the gas released during heating is supplied continuously for picking up the gas released during heating by said furnace, said gas analyzer indicating as a function of this supplied gas the quantities of the gas released in equal periods of time, and

a computer operatively coupled to said furnace and to said gas analyzer,



said gas analyzer providing as an output, a measured value sequence in the form of an oxide spectrum curve or Evologram characteristic thereof for the gas quantities released per unit time to said computer for the determination of the bond forms of the gases contained in the sample,

said computer detecting the desired values from the characteristic curve and forming a first derivative curve and a second derivative curve from the said measured value curve or Evologram corresponding to the entered measured value sequence, for forming subtotals of these measured values between successive points in a minimum position and/or points which occur as a second inflection point immediately after a first inflection point on the measured value curve or, these positions, minima, inflection point after inflection point being identified from the first and second derivatives of the measured value curve by zero indications and extreme positions.

4,229,413

ADJUSTABLE DEVICE FOR DISTRIBUTING LIQUID SAMPLES

Eric Marteau d'Autry, 69-72 rue Gambetta, 95 Villiers-le-Bel, France

Filed Apr. 21, 1978, Ser. No. 898,548

Claims priority, application France, Apr. 27, 1977, 77 12696

Int. Cl.[3] **B01L** *3/02;* **G01N** *1/14*

U.S. Cl. 422—100 **16 Claims**

1. An adjustable device for distributing liquid samples, comprising, in combination:

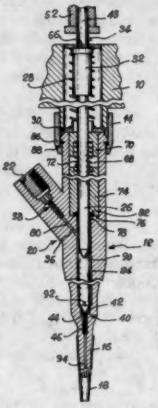
a casing incorporating a mechanism for adjusting the volume of liquid samples to be distributed, a volume indicator unit coupled with said mechanism;

a lower tip member terminating in a tapering end, said casing including a lateral supply tube, provided with a first non-return valve and means for allowing tight holding of a reservoir containing said liquid sample to be distributed;

a measuring chamber arranged in said tip member for receiving, with a slight clearance, a calibrated piston reciprocally mounted in said chamber and in the lower part of the casing, said piston being elastically urged upwardly, the upper end of said piston cooperates with a stop for limiting upward stroke, said piston being adjustable in position by means of said adjusting mechanism, said chamber communicating near its upper end with an outside medium with the interposition of a second non-return valve;

a control shaft including a push button at the upper end thereof and the lower end of said control shaft cooperates with said upper end of the piston, said shaft including retaining means for preventing upward escape of said shaft; and

means for ensuring the tight holding of the measuring chamber, near its upper end and above the inlet of said lateral



supply tube, said mechanism for adjusting the volume of liquid samples comprises a hollow, externally threaded shaft cooperating with an internally threaded insert, fixed so as to be immobile in rotation and in translation inside said casing thereby immobilizing said threaded shaft, as well as a nut for driving said hollow, threaded shaft in rotation, said nut actuated from outside the casing for modifying the vertical position of said stop for limiting the upward stroke of the piston, the control shaft passing through said hollow externally threaded shaft.

4,229,414

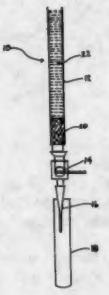
ADHERENCE COLUMN

Vera J. Stecher, and George L. Chinea, both of Dobbs Ferry, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,790

Int. Cl.[2] **G01N** *31/06, 33/16, 21/24*

U.S. Cl. 422—101 **3 Claims**



1. An assembly for determining neutrophil adherence comprising a column, closure and delivery means positioned at the

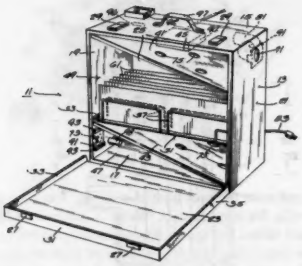
bottom end thereof and nylon fibers packed into said column approximately adjacent said closure means, said fibers being packed in said column in a density of from about 200–350 g/l.

4,229,415

INDUSTRIAL DEODORIZER

John D. Bryson, Milwaukee, Wis., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed Jun. 12, 1978, Ser. No. 914,422
Int. Cl.[2] A01M *19/00*; A61L *9/01, 9/02*
U.S. Cl. 422—109 **20 Claims**



1. A vapor dispenser comprising a rectangular housing including interconnected top and bottom walls, opposed front and back walls, opposed first and second end walls, door means in said front wall for providing an access opening which can be opened and closed, a first partition extending in spaced relation to said top wall and between said end walls and between said front and back walls to define an air intake chamber between said first partition and said top wall, air inlet means communicating with said air inlet chamber, a second partition extending in spaced relation to said bottom wall and in generally parallel relation to said first partition and between said end walls and between said front and back walls to define an air outlet chamber between said second partition and said bottom wall and to define a central chamber between said first and second partitions, air outlet means communicating with said air outlet chamber, aperture means in said first and second partitions for affording air flow from said air inlet chamber to said central chamber and from said central chamber to said air outlet chamber, at least one tray member, means on said first and second end walls for horizontally supporting said tray member in said central chamber and for facilitating at least partial withdrawal of said tray member through said front wall access opening and means on said tray member for removably holding a plurality of relatively thin rectangular envelopes which contain a vaporizable substance to be dispensed as a vapor into the flow of air and which are arranged in parallel vertical relation to each other to permit air flow past said envelopes from said air inlet chamber to said air outlet chamber.

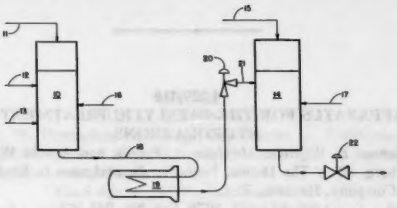
4,229,416

DUAL REACTOR APPARATUS FOR POLYMERIZING ETHYLENE

Charles R. Donaldson, and Claude J. Stiles, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,801
Int. Cl.[2] B01J *1/00*
U.S. Cl. 422—134 **3 Claims**

1. In a two stage, flow reactor system for polymerizing, e.g., ethylene, comprising a first reactor for operation at a high pressure, a second reactor for operation at a pressure lower than said first reactor, and an intercooler; a first conduit connecting said first reactor to said intercooler; a second conduit connecting said intercooler to said second reactor; and a pressure reducing valve located in said flow system between said first and said second reactors for reducing the operating pressure of the system between said first and said second reactors,



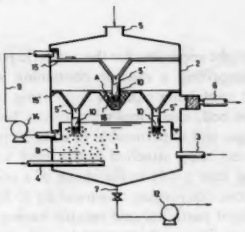
the improvement comprising said pressure reducing valve being located in said second conduit.

4,229,417

GAS-LIQUID CONTACTING APPARATUS

Toshio Kanai; Hiroshi Yanagioka, both of Yokohama; Hideo Idemura, Tokyo; Hiroshi Sugiyama, Yokohama; Yoshio Kogawa, Fujisawa; Michihiro Yoshida, Tokyo; Mitsugu Kitamura, Yokohama, and Teruo Sugiya, Kawasaki, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Kanagawa, Japan

Division of Ser. No. 772,779, Feb. 28, 1977, Pat. No. 4,156,712.
This application Jul. 29, 1977, Ser. No. 820,333
Claims priority, application Japan, Feb. 28, 1976, 51-20608; Feb. 28, 1976, 51-20609; Nov. 18, 1976, 51-137821
Int. Cl.[3] F01C *1/00*; F03C *2/00*
U.S. Cl. 422—176 **3 Claims**



1. A gas-liquid contacting apparatus for removing sulfur dioxide from a flue gas, which comprises:

(a) a vessel for receiving therein a liquid aqueous absorbent in a continuous phase;

(b) funnel-shaped gas sparger means for concurrently introducing the gas and aqueous absorbent, said gas sparger means having a large open end, a small open end, and an opening means at one end thereof, said gas sparger means extending vertically with said large open end above the surface of the aqueous absorbent liquid and said gas sparger means extending through the surface such that said opening means is positioned below the surface wherein said opening means comprises notch means formed in the side walls of said small open end of said gas sparger means;

(c) air sparger means in said aqueous absorbent, below said gas sparger means;

(d) outlet means for the gas after it contacts the aqueous absorbent, the outlet means being located above the level of said aqueous absorbent;

(e) reactant inlet means into the vessel;

(f) aqueous absorbent inlet means into the vessel;

(g) outlet means for the reaction products and spent aqueous absorbent; and

(h) circulation means for circulating aqueous absorbent from

below the surface of said aqueous absorbent liquid to said large open end.

4,229,418

APPARATUS FOR THE CATALYTIC TREATMENT OF HYDROCARBONS

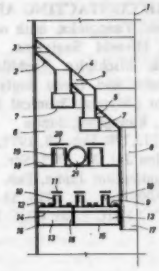
Joannes B. Wijffels; Abraham A. Pegels, and Arnold Wezenberg, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 3, 1978, Ser. No. 948,353

Claims priority, application Netherlands, Oct. 7, 1977, 7711019

Int. Cl.[3] B01D *39/00;* B01J *8/04*

U.S. Cl. 422—191 5 Claims



1. An upright apparatus for the catalytic treatment of hydrocarbons comprising a reactor containing at least two tray means, and containing catalyst supporting means for at least one catalyst bed, said supporting means being permeable to liquid and gas and impermeable to catalyst particles, said supporting means being attached to the inner wall of the reactor and being at least partly in the shape of a conical surface of a truncated cone converging downwardly to an aperture permeable to catalyst particles; said reactor having at least one supporting means-filter unit attached to said supporting means to obtain impermeability of the supporting means to the catalyst particles; disposed beneath each said supporting means is a first cooling tray means, impermeable to liquid and gas, for cooling liquid accumulated on said cooling tray means during catalytic hydrotreatment of hydrocarbons, said cooling tray means having an aperture permeable to catalyst particles, and a plurality of walled apertures permeable to liquid and gas, each of said walled apertures having upright cylindrical walls protruding above said cooling tray means for accumulating liquid on the upper surface of said cooling tray means, and spaced above each said walled aperture is a liquid impermeable cover plate for preventing direct bypassing of liquid between said supporting means and a second, hereafter described distribution tray means; disposed on said cooling tray means is at least one cooling conduit, adapted to be connected to a source of cooling fluid, for cooling liquid accumulated on said cooling tray means; located beneath each said cooling tray means is a second, distribution tray means which is permeable to liquid and gas, for effecting redistribution of liquid flowing out of the catalyst bed and impermeable to the catalyst particles and having an aperture permeable to catalyst particles; and at least one distribution tray means filter unit disposed underneath said distribution tray means to prevent access of catalyst particles to the underside of said distribution tray means, said distribution tray means filter unit having the same or coarser filtering effect than said supporting means filter unit.

4,229,419

TUBE REACTOR FOR ENDOTHERMIC GAS REACTIONS

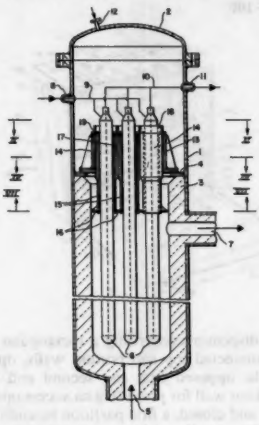
Egon Haese, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 856,705

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656726

Int. Cl.[2] B01J *8/00, 3/04*

U.S. Cl. 422—197 5 Claims



1. In a tube-type reactor receiving a pressurized noble gas at a temperature within the range of approximately 600° C. and 1000° C. after heating in a nuclear reactor for carrying out an endothermic chemical reaction with a gas, said tube-type reactor including a pressure jacket with internal insulation, reactor tube assemblies, containing a catalyst when required, extending vertically within said pressure jacket, mounting plate means permanently secured to top end portions of said reactor for support by the upper part of said pressure jacket, noble gas feed means to introduce said pressurized noble gas into the bottom portion of said pressure jacket, and noble gas discharge means in the upper part of said pressure jacket below said mounting means for discharging the noble gas from the pressure jacket, the combination therewith of the improvement comprising cover tubes each surrounding a portion of one of said reactor tube assemblies, each cover tube extending within the space between the bottom surface of said mounting plate means and a point in elevation which is slightly above said noble gas discharge means, a reinforced closure member extending only from the lower end portion of each cover tube to limit the flow of noble gas beyond the closure members into the space above the closure members between the cover tubes and the inner wall of said pressure jacket while allowing the flow of noble gas between said feed means and discharge means, and sealing container means including end members supported by said mounting plate means to form a gas-tight seal between the top side of said mounting plate means and said reactor tube assemblies.

4,229,420

SURGICAL INSTRUMENT RACK

Galyn F. Smith, Schaumburg, and Thomas P. Zwierszowski, Niles, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

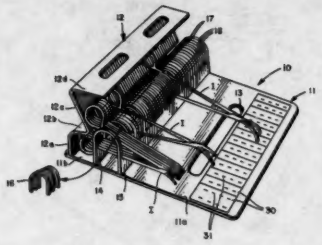
Filed Mar. 26, 1979, Ser. No. 23,886

Int. Cl.[2] A61L *3/02*

U.S. Cl. 422—310 26 Claims

1. A rack for supporting a multiplicity of ring-handled surgical instruments, comprising a support member having a sub-

stantially flat surface and being provided with an upstanding wall dividing said member into front and rear portions; a plurality of spaced partitions projecting upwardly from said wall, whereby, a plurality of ring-handled instruments may be supported with each instrument oriented in a generally vertical plane with its handles extending between a pair of partitions and with a lower handle ring thereof disposed directly above said rear portion and behind said wall; and a retaining member



engaging said rear portion of said support member; said retaining member having a cover section spaced above said rear portion to limit upward movement of the lower handle rings of instruments carried by said support member and also having a sloping cam section engagable with the upper rings of such instruments to cam the handles thereof into partially opened condition and to limit movement of said instruments rearwardly away from said upstanding wall.

4,229,421

PURIFICATION OF PLUTONIUM

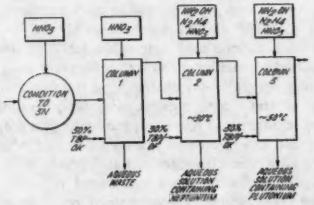
Edward S. Chapman, and William Smith, both of Whitehaven, England, assignors to British Nuclear Fuels Limited, Cheshire, England

Filed Sep. 6, 1978, Ser. No. 940,010

Claims priority, application United Kingdom, Sep. 16, 1977, 38786/77

Int. Cl.[2] C01G *56/00*

U.S. Cl. 423—10 **1 Claim**



1. A process for the purification of a plutonium-containing aqueous phase during the reprocessing of irradiated nuclear fuel in which the aqueous phase also contains some uranium and neptunium includes the steps of bringing the plutonium-containing aqueous phase into contact with an organic solvent, which solvent comprises a solution of an alkyl ester of phosphoric acid in an organic diluent, to extract plutonium, uranium and neptunium into solution in the organic solvent, bringing the organic solution into contact with a first aqueous phase containing a reductant for neptunium selected from the group consisting of hydroxylamine salts, hydrazine salts and mixtures of hydroxylamine and hydrazine salts at about 30° to 35° C. to extract neptunium into the aqueous phase, separating the organic solution from the aqueous phase, bringing the organic solution into contact with a further aqueous phase containing a reductant for plutonium selected from the group consisting of hydroxylamine salts, hydrazine salts and mixtures of hydroxylamine and hydrazine salts at about 50° C. to extract plutonium into the further aqueous phase and separating the organic solvent from the further aqueous phase.

4,229,422

METAL EXTRACTION

James W. Covington, Stevenage, and Robert G. Whittemore, Shefford, both of England, assignors to Interox Chemicals Limited, London, England

Filed Apr. 17, 1978, Ser. No. 897,128

Claims priority, application United Kingdom, May 3, 1977, 18510/77

Int. Cl.[2] B01D *12/00*

U.S. Cl. 423—20 **8 Claims**

1. A process for the extraction of uranium from its ore comprising the step of leaching the ground ore with an aqueous acidic solution containing peroxomonosulphuric acid.

4,229,423

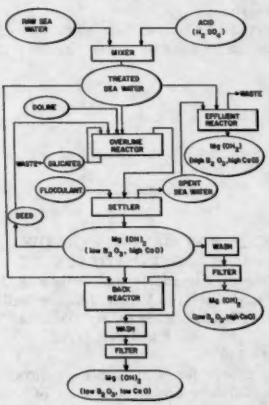
METHOD OF PRODUCING MAGNESIUM HYDROXIDE

Lloyd M. Housh, Santa Clara, and William R. Alder, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 9, 1979, Ser. No. 10,577

Int. Cl.[2] C01F *5/22*

U.S. Cl. 423—164 **7 Claims**

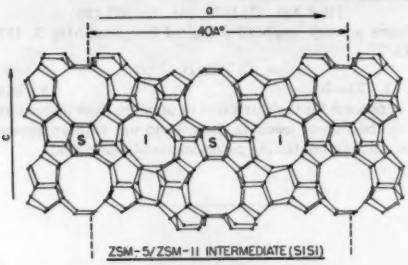


1. Method of producing magnesium hydroxide by (1) treating a brine containing Mg^{++} ions and at least 1 ppm boron (on a B_2O_3 basis) so as to reduce its CO_2 content to less than 15 ppm, (2) reacting, in a first reaction stage, the treated brine with an amount of calcined lime in excess of that needed to convert the Mg^{++} ion content thereof to magnesium hydroxide, (3) separating the high-lime magnesium hydroxide so produced from the spent brine, (4) recycling part of the high-lime magnesium hydroxide from the first reaction stage back to the first reaction stage as seed, and (5) reacting, in a second reaction stage, the remainder of the high-lime magnesium hydroxide produced in the first reaction stage with brine treated as in step (1), whereby a magnesium hydroxide is produced which contains, on the ignited basis, less than 1% CaO and less than 0.1% B_2O_3, all percentages being by weight.

4,229,424
CRYSTALLINE ZEOLITE PRODUCT CONSTITUTING ZSM-5/ZSM-11 INTERMEDIATES

George T. Kokotailo, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,482
Int. Cl.[3] C01B *33/20, 33/28*
U.S. Cl. 423—328 10 Claims



1. A crystalline porous tectosilicate characterized by a structure intermediate that of ZSM-5 and ZSM-11, having in its sodium form, an X-ray diffraction pattern substantially as shown in Table 1 and having a unit cell parameter of at least about 40 Angstroms.

2. The crystalline porous tectosilicate of claim 1 further characterized, in its anhydrous state, by the formula:

$$0.9 \pm 0.3 \frac{M_{2O}}{n} : Al_2O_3 : SiO_2$$

where M is a cation, n is the valence of said cation and z is at least 5.

4,229,425
PROCESS FOR MAKING HOLLOW CARBON MICROSPHERES

Robert G. Shaver, Alexandria, and William R. Leake, Reston, both of Va., assignors to Versar, Inc., Springfield, Va.

Filed Feb. 9, 1979, Ser. No. 10,867
Int. Cl.[2] C01B *31/02*
U.S. Cl. 423—449 4 Claims

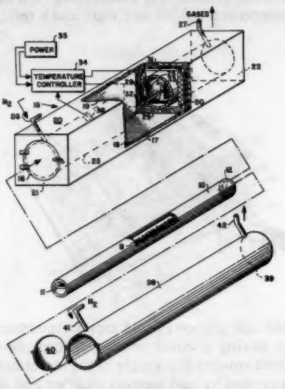
1. A batch process for manufacturing hollow carbon microspheres from hollow microballoons made of heat carbonizable material and having microporous walls, including the steps of:

(a) heating a first chamber to a temperature which is above the carbonizing temperature of said microballoon material and within the range of 2000 to 3000 degrees F., and continuously maintaining the temperature;

(b) enclosing a batch of microballoons within a protective graphite boat which substantially surrounds the microballoons except for small openings sufficient to pass gases through the boat;

(c) confining and heating the boat and batch in the heated first chamber for about four hours and until the batch is carbonized to form microspheres while flushing the chamber with an inert gas, the enclosing of the batch in the carbon of the boat and the heat insulating properties of the enclosing boat being sufficient to slow the rate of heat transfer from the first chamber to the batch and prolong it over an interval of time sufficient to allow the expanding gases within the microballoons to diffuse through their micropores without rupturing the microballoons;

(d) then removing the heated batch from the first chamber and immediately confining it in a second unheated chamber, and flushing the second chamber with an inert gas



until the batch cools below its self-ignition temperature in air; and

(e) confining in the first chamber another batch of microballoons within another protective boat according to step (b), and repeating the heating and cooling steps (c) and (d) for said other batch.

4,229,426
BREAST CYST FLUID PROTEIN ASSAY

Darrow E. Haagensen, Jr., Durham, N.C., assignor to Duke University, Inc., Durham, N.C.

Filed Feb. 22, 1978, Ser. No. 880,257
Int. Cl.[2] G01N *33/16;* A61K *39/00, 43/00*
U.S. Cl. 424—1 12 Claims

1. A method for determing the concentration of the glycoprotein gross cystic disease fluid protein-15 (GCDFP-15) in a biological fluid sample which method comprises conducting an immunoassay for said glycoprotein in said sample utilizing as reagents a GCDFP-15 selective antibody and GCDFP-15 labelled with a unique and detectable label to produce an antigen-antibody reaction product, separating said product from the said reagents and determining the concentration of GCDFP-15 in said sample by detecting the quantitative value of said label in either said reaction product or said reagents and comparing said label value to a standard curve wherein said GCDFP-15 is further characterized as follows:

(a) a glycoprotein having a calculated monomer size of about 15,000 daltons as determined by sodium dodecyl sulfate acrylamide gel analysis; and

(b) immunologically not identical to any components of plasma as determined by Ouchterlony analysis; and

(c) immunological cross identity with a component of human milk and human saliva.

4,229,427
RADIOACTIVE SCANNING AGENTS WITH HYDROQUINONE STABILIZER

Harry S. Whitehouse, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 28, 1978, Ser. No. 920,081
Int. Cl.[2] A61K *43/00, 29/00*
U.S. Cl. 424—1 21 Claims

1. A stable composition, useful in the preparation of technetium-99 m-based radiographic scanning agents, comprising: a pertechnetate reducing agent; and a stabilizing amount of a

quinone stabilizer selected from hydroquinone and quinonoid species thereof.

17. A composition useful in the preparation of technetium-99 m-based radiographic scanning agents, comprising: an oxidized pertechnetate solution having dissolved therein a stabilizing amount of a quinone stabilizer selected from hydroquinone or a quinonoid species thereof.

4,229,428

GALENICAL FORM OF ADMINISTRATION OF BETAHISTINE AND ITS DERIVATIVES

Jean S. Cherqui, 55, Rue Pergolèse, 75016 Paris, and Alain C. Djiane, 105, Avenue du Roule, 92200 Neuilly sur Seine, both of France

Filed Apr. 5, 1979, Ser. No. 27,351
Int. Cl.[2] A61K *9/22, 9/32*
U.S. Cl. 424—19 6 Claims

1. A therapeutically useful and pharmacologically acceptable oral depot medicament in the form of substantially uniformally sized spheroidal particles containing 2-methylaminoethyl pyridinemethanesulfonate as the active ingredient thereof comprising

(a) an inactive core of pharmaceutically acceptable carrier material;

(b) at least two sets of sequential bipartite layers on said core comprising an inner layer of the active ingredient and an outer layer of a dialysis membrane, said membrane being substantially insoluble in neutral or acid environments but soluble above pH 7.

4,229,429

PROCESS FOR PREPARING ALCOHOL SOLUBLE CONDENSATES OF ABIETIC ACID AND A PROTEIN HYDROLSATE

Vernon L. Johnsen, La Grange, and Elaine S. Stern, Evanston, both of Ill., assignors to Inolex Corporation, Chicago, Ill.

Division of Ser. No. 761,668, Jan. 24, 1977, Pat. No. 4,128,543. This application Sep. 20, 1978, Ser. No. 944,182
Int. Cl.[2] A61K *7/11*
U.S. Cl. 424—47 6 Claims

1. A process for making a solution for the treatment of hair comprising:

forming a solution in absolute alcohol at a concentration in the range of about 0.5 percent to about 5 percent by weight of a portion of an abietic acid condensate of a protein hydrolysate having complete solubility in absolute alcohol at a concentration of about 2 percent, said portion having been separated from said condensate by acidifying an aqueous solution of about 5 to about 25 percent by weight of a water soluble salt of a condensate with abietic acid of a protein hydrolysate having an average molecular weight in the range of about 300 to about 600 from a pH above about 6 to a pH in the range of about 4 to about 5 to precipitate a portion of the condensate while leaving another portion thereof in solution; and separating the precipitated portion of the condensate from the acidified aqueous solution as a product of the process.

4,229,430

ORAL COMPOSITION FOR IMPROVING ORAL HEALTH

Mostafa S. Fahim, 500 Hulen Dr., and Ercell L. Miller, 3424 Woodrail Ter., both of Columbia, Mo. 65201

Filed Aug. 21, 1978, Ser. No. 935,247
Int. Cl.[3] A61K *7/16, 31/365, 33/30*
U.S. Cl. 424—49 10 Claims

1. A therapeutic composition for topical oral administration for stimulating production of collagen consisting essentially of about 0.5 to about 2.0 percent by weight/volume of a pharmaceutically acceptable, water soluble zinc salt and about 0.5 to about 2.0 percent by weight/volume of ascorbic acid or sodium ascorbate.

4,229,431

METHOD OF APPLYING SELF CURING ARTIFICIAL NAILS

Henry L. Lee, Jr., Pasadena, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 834,265, Sep. 19, 1977, abandoned, which is a division of Ser. No. 665,214, Mar. 9, 1976, abandoned, which is a continuation of Ser. No. 527,221, Nov. 26, 1974, abandoned. This application Feb. 5, 1979, Ser. No. 9,687
Int. Cl.[3] A61K *7/04, 7/043*
U.S. Cl. 424—61 23 Claims

1. A method of coating a human nail comprising:

(1) applying to the nail a flowable composition that comprises by weight based on the total weight of the composition:

(a) from about 5% to about 80% of a first addition polymerizable monomer that can form a cross-linked polymer upon polymerization during self-curing of the composition, which monomer contains in its molecule at least two groups that are capable of being addition polymerized upon contact with a peroxide-type free radical initiator and a tertiary amine-type accelerator, the polymerizable groups being selected from the group consisting of allyl, acryloyl, methacryloyl, and mixtures thereof;

(b) an amount up to about 60% of an acrylic or methacrylic monoacrylate ester monomer that copolymerizes with the first monomer upon self-curing of the composition to form a copolymeric structure that is cross-linked;

(c) a peroxide-type initiator;

(d) a tertiary amine-type accelerator, the composition being formulated and the initiator and the accelerator being present in quantities such that curing is caused to occur within about 120 to about 400 seconds after mixing of the components to form the composition,

(2) permitting the composition to cure and to harden in situ on the nail, the monomers (a) and (b) copolymerizing upon curing to form a copolymeric structure that is cross-linked.

4,229,432

ANTIPERSPIRANT STICK COMPOSITION

Navin Geria, Elizabeth, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Apr. 19, 1978, Ser. No. 897,888
Int. Cl.[3] A61K *7/34, 7/38*
U.S. Cl. 424—68 9 Claims

1. In an antiperspirant stick composition consisting essentially of, based on the total weight of the composition:

(a) from about 16% to about 35% by weight of a low melting wax selected from the group consisting of a fatty acid containing from about 8 to 22 carbon atoms, a fatty alcohol containing from about 8 to about 22 carbon atoms, a silicone wax and glycerol monostearate;

(b) from about 20% to 60% of an emollient; and

(c) from about 10% to 50% of an antiperspirant material; the improvement which comprises:

(d) from about 0.5% to about 10.0% of the additional waxy agent FT-300 Wax incorporated in said stick composition, said FT-300 Wax being characterized in that it is a saturated, synthetic hard paraffin of formula $CH_3(CH_2)_nCH_3$ and is chemically neutral, colorless and high melting; is free from aromatic and unsaturated compounds and contains neither sulfur nor any halogens; has a structure that is characterized as fine crystalline; appearance in the solid state is white and opaque; and forms a clear solution in the common wax solvents at elevated temperature it is practically insoluble and has the following properties:

Molecular weight, osmometric

-continued

approx.	730
Congealing point, (°C. ASTM) (D-938)	96–98
Drop Point (°C., ASTM D-127)	107–111
Penetration (25° C., ASTM D-1321)	1
Ball Pressure Hardness kg/cm^2	
DIN 51 579	355/344
Kinetic Viscosity, cstks, 120° C. (Vogel-Ossag)	12
Iodine No.	0.1
Acid Value, Saponification Value	nil
Color	white
Form	flakes

said FT-300 Wax serving to prevent the settling of said antiperspirant material.

4,229,433

METHOD FOR CONTROLLING VIRAL DISEASES IN PLANTS

Taichiro Shigematsu, Machida; Tetsuya Shibahara, Yamato, and Tetsuo Nakajima, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

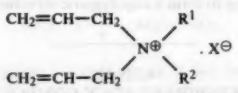
Filed May 17, 1979, Ser. No. 40,077

Claims priority, application Japan, May 30, 1978, 53-64743; Feb. 20, 1979, 54-18794

Int. Cl.[3] A01N *43/84, 43/86, 43/40, 43/36*

U.S. Cl. 424—78 **17 Claims**

1. A method for preventing viral diseases in plants comprising applying to said plants an antiviral effective amount of a polymer produced by the polymerization of one or two compounds expressed by the following general formula:



wherein R^1 and R^2, which may be the same or not, represent a hydrogen atom or an alkyl group having 1–5 carbon atoms which may be substituted by a halogen atom, a hydroxyl group or a cyano group, or together form a pyrrolidine, piperidine, or morpholine ring with the nitrogen to which they are attached, and X is a halogen atom.

4,229,434

VACCINE FOR PROPHYLAXIS OF TRICHOPHYTOSIS IN HORSE AND METHOD OF PREPARING SAME

Arutjun K. Sarkisov, and Svyatoslav V. Petrovich, both of Moscow, U.S.S.R., assignors to Vsesojuzny Institut Experimentalnoi Veterinarii, Moscow, U.S.S.R.

Continuation of Ser. No. 719,976, Sep. 2, 1976, abandoned. This application Jan. 30, 1979, Ser. No. 7,683

Int. Cl.[2] A61K *39/00*

U.S. Cl. 424—88 **9 Claims**

1. A vaccine for prophylaxis of trichophytosis in the horse, comprising a suspension of microconidia of the immunogenic strain No. L-2251/70 (USSR) of Trichophyton equinum in sterile physiological salt solution at a pH of 6.2 to 7.0, the concentration of the microconidia ranging from 30 to 45 million per 1 milliliter of the sterile physiological salt solution.

4,229,435

PREPARATION OF BLOOD FRACTION

Birger E. G. Blombäck, 31 Tomtebogatan S-113 38, Stockholm, and Dagny B. Hessel, 139 Rädisvagen, S-162 41 Vällingby, both of Sweden

Filed Jan. 23, 1979, Ser. No. 5,877

Claims priority, application Sweden, Jan. 25, 1978, 7800902

Int. Cl.[2] A61K *35/14*

U.S. Cl. 424—101 **10 Claims**

1. A process for the preparation of a blood component selected from the group consisting of a concentrate of at least one of the coagulation factors II, V and VIII and mixtures thereof and plasma free from one of the factors VII, IX, X, XI and XII and mixtures thereof, said process comprising:

(1) adding a reducing agent selected from the group consisting of dithiothreitol, dithioerythritol, lipoic acid, mercaptoethanol and borohydrides to blood or plasma, the reducing agent added in an amount and for a reaction time sufficient to isolate the desired blood component, and

(2) fractionating the blood and plasma, respectively, to isolate said blood component.

4,229,436

ANTIBIOTIC G-6302

Akira Imada, Nishinomiya; Kazuaki Kitano, Sakai, and Mitsuko Asai, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 15, 1978, Ser. No. 971,089

Claims priority, application Japan, Dec. 30, 1977, 52/160308

Int. Cl.[3] A61K *35/00*

U.S. Cl. 424—117 **3 Claims**

1. A member selected from the group consisting of Antibiotic G-6302 having the following characteristics, and a metal or ammonium salt thereof:

(1) Melting point: 120° C. (sintering), 130° C. (decomp.)

(2) Appearance: white powder

(3) Elemental analysis: (%) C 34.99, ±0.5; H 5.58, ±0.5; N 13.30, ±0.5; O 38.13, ±0.5; S 7.70, ±0.5 (as dried at 40° C. for 6 hours over phosphorus pentoxide under reduced pressure)

(4) Ultraviolet absorption spectrum: No characteristic absorptions over 210 nm

(5) Infrared absorption spectrum [KBr, dominant absorptions (wave-numbers, cm^{-1})]: 1770, 1650, 1530, 1240, 1043

(6) Specific rotation: $[\alpha]_D^{23}+94°\pm10°$ (c=0.35, H_2O)

(7) Solubility: Insoluble in petroleum ether, hexane, diethyl ether, benzene, ethyl acetate and chloroform; sparingly soluble in ethanol, pyridine and acetone; soluble in methanol and dimethylsulfoxide; and readily soluble in water

(8) Basicity, neutrality or acidity: Acid

(9) Molecular weight: 400±20 (by titrometry)

(10) Color reactions: Positive: ninhydrin and potassium permanganate reactions; negative: ferric chloride-potassium ferricyanate, Sakaguchi and Molisch reactions; doubtful positive: Ehrlich reaction.

4,229,437

PASTE OR DOUGH-LIKE SALVE FOR TREATING SKIN

Jonas S. Likens, deceased, late of Lafayette, Tenn. (by Ruby L. Ford, Jessie W. Likens, Mary F. L. Coulter, Pauline L. Coulter, heirs), and Lucille L. Filson, heir, Rte. 1, Hartsville, Tenn. 37074, assignors to Lucille Likens Filson, Hartsville, Tenn.

Filed Jul. 18, 1978, Ser. No. 873,087

Int. Cl.[2] A61K *33/30, 35/78*

U.S. Cl. 424—145 **2 Claims**

1. A paste or dough-like salve for treating skin topically which is substantially hemogeneous and consists essentially of an admixture of a minor volumetric effective proportion of zinc chloride crystals with a major volumetric effective proportion of dried and ground bark of roots from *Solanum dulcamara.*

4,229,438

NONAPEPTIDES

Masahiko Fujino, Takarazuka; Osamu Nishimura, Toyonaka, and Muneo Takaoki, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 7, 1979, Ser. No. 36,988
Claims priority, application Japan, May 12, 1978, 53/57007
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 11 Claims

1. A nonapeptide of the formula:

pGlu-X-Lys-Ser-Gln-Y-Z-Ser-Asn-OH

wherein X is Ala or (D)-Ala; Y and Z are the same or different and each is the residue of a D-amino acid selected from the group consisting of alanine, leucine, isoleucine, phenylalanine, valine, 2-amino-n-butyric acid, serine, threonine, norleucine, methionine, norvaline and tyrosine, or Gly; and at least one of X, Y and Z is the residue of D-amino acid.

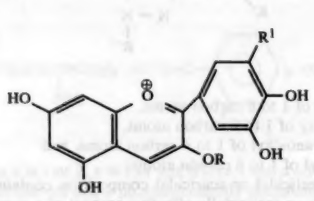
4,229,439

METHOD OF TREATMENT OF ATHEROMA

Bernard Majoie, Dijon, France, assignor to Societe de Recherches Industrielles (SORI), Paris, France

Filed Nov. 21, 1977, Ser. No. 853,422
Int. Cl.[3] A61K *31/70;* C07H *17/06*
U.S. Cl. 424—180 6 Claims

1. A method for reducing retension of cholesterol in arteries which comprises administering to a patient in need of such a treatment, a therapeutically effective amount of at least one anthocyanidin compound which is a salt of the cation of the formula



(I)

wherein R represents a glycosyl group and R^1 represents H, OH or OCH_3; and a non-toxic anion.

4,229,440

PHARMACEUTICAL COMPOSITION CONTAINING THE POLYSACCHARIDE KGF-C AS ACTIVE INGREDIENT

Mitsugu Murofushi; Kuniaki Sasaki, both of Yokohama; Michio Shiomi, Isehara; Yoshio Uchida, Hiratsuka; Tokihisa Hattori, Mishima, and Keniti Takeda, Machida, all of Japan, assignors to Fujiya Confectionery Company Limited, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 963,967
Int. Cl.[3] A61K *31/735;* C08B *37/00*
U.S. Cl. 424—180 1 Claim

1. A composition effective for the treatment of sarcoma-180 and Ehrlich carcinoma tumors, comprising a physiologically acceptable excipient and an effective amount of KGF-C having the following physical and chemical properties:

(1) Appearance: tasteless and odorless white powder having a little hygroscopicity;

(2) Solubility: soluble in water and pyridine and insoluble in alcohol, glacial acetic acid, acetone, benzene, carbon tetrachloride, chloroform, ether and tetrahydrofuran;

(3) The pH of 1% aqueous solution is 6.89;

(4) Sugar qualitative reaction: with respect to the 1% aqueous solution and liquid hydrolyzate thereof, Molish tests are positive in both 1% aqueous solution and 0.1% liquid hydrolyzate and Tollens reaction test is negative in 1% aqueous solution but is positive in 0.1% liquid hydrolyzate;

(5) Specific optical rotation: $(\alpha)_D^{20} = +62.0°$ C. (C=1, water);

(6) Sugar content: 99% is shown by phenol sulfuric acid method; KGF-C is composed of polysaccharide as principal component, and a very small amount of nitrogenous component;

(7) Sugar composition: when KGF-C is hydrolyzed by 0.5% H_2SO_4 at 110° C. for 5 hours and the sugar composition is determined by thin layer chromatography and gas chromatography, the results show that it is composed of glucose and galactose in the ratio of 1:1;

(8) Ultraviolet absorption spectrum: no particular absorption is observed;

(9) Infrared absorption spectrum: the spectrum is shown in the drawing; and

(10) Elemental analysis: C: 41.83%, H: 6.19%, N: 0.20%, S: below 0.2% and P: below 0.2%.

4,229,441

IMMUNOLOGIC ADJUVANT

Robert L. Bugianesi, Colonia; Mitree M. Ponpipom, Branchburg, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 1, 1978, Ser. No. 965,559
Int. Cl.[3] A61K *31/705;* C07G *79/08*
U.S. Cl. 424—182 4 Claims

1. A compound selected from the group consisting of:
6-(5-cholesten-3β-yloxy)hexyl 1-thio-β-L-fucopyranoside;
6-(5-cholesten-3β-yloxy)hexyl 1-thio-β-D-glucopyranoside;
6-(5-cholesten-3β-yloxy)hexyl 2-acetamido-2-deoxy-1-thio-β-D-glucopyranoside;
6-(5-cholesten-3β-yloxy)hexyl 2-acetamido-2-deoxy-1-thio-β-D-galactopyranoside;
6-(5-cholesten-3β-yloxy)hexyl 1-thio-β-D-xylopyranoside;
6-(5-cholesten-3β-yloxy)hexyl 1-thio-α-L-arabinopyranoside;
6-(5-cholesten-3β-yloxy)hexyl 1-thio-β-lactoside, and
2-S-[6-(5-cholesten-3β-yloxy)hexyl]-2-thio-β-D-N-acetyl-neuraminic acid.

3. A composition comprising an antigenic material and a compound of claim 1.

4,229,442

METHOD FOR THE TREATMENT OF TREES OR SHRUBS AFFECTED WITH DECLINE SYMPTOMS WITH TREATED COTTON GIN WASTE

Joseph A. Pinckard, Inglis, Fla., assignor to The Ekok Corporation, Ocala, Fla.

Division of Ser. No. 887,963, Mar. 20, 1978, Pat. No. 4,164,405, and a continuation-in-part of Ser. No. 544,669, Jan. 27, 1975, abandoned. This application Apr. 24, 1979, Ser. No. 34,913
Int. Cl.[2] A01N *9/08*
U.S. Cl. 424—195 9 Claims

1. A method for the treatment of trees or shrubs affected with symptoms of Young Tree Decline symptoms which comprises placing about the locus of the roots of said trees or shrubs, in an amount sufficient to suppress the symptoms of Young Tree Decline a horticultural medium having been produced by the process of aerobically fermenting cotton gin waste to biodegrade the waste at a temperature of at least 125° F. with water in an amount ranging from 1 to 5 times the dry weight of the gin waste, said gin waste being in a pile at least 10 feet wide and 8 feet high to conserve self-generated heat in the interior of the pile, and systematically turning the exterior of the pile to the interior so that all particles of the gin waste are heated to a temperature of from 125° to 180° F. for at least several hours, whereby the gin waste is freed of any soil borne plant diseases, weed seeds, insects or nematodes present therein.

4,229,443
DERIVATIVES OF PENICILLANIC ACID

Ernst T. Binderup, Tastrup, Denmark, assignor to Leo Pharmaceutical Products, Ltd. A/S, Ballerup, Denmark

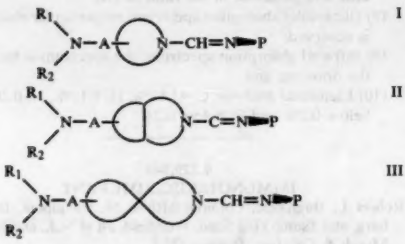
Filed Jun. 14, 1977, Ser. No. 806,358

Claims priority, application United Kingdom, Jun. 29, 1976, 27107/76; Jul. 27, 1976, 31331/76; Feb. 9, 1977, 5436/77; Feb. 15, 1977, 6348/77

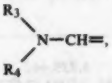
Int. Cl.[2] **A61K** *31/675, 31/425, 31/43;* **C07D** *499/02*

U.S. Cl. 424—200 **55 Claims**

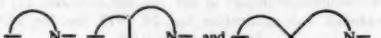
1. An antibiotic compound of the general formulae I, II, and III



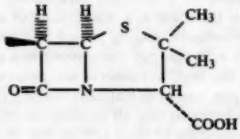
in which -A- stands for a straight or branched, saturated or unsaturated aliphatic hydrocarbon radical, having from 1 to 6 carbon atoms, which radical optionally can be substituted with an amino radical; R_1 stands for hydrogen, or a lower alkyl radical having from 1 to 4 carbon atoms; R_2 stands for hydrogen, a lower alkyl radical having from 1 to 4 carbon atoms, or a monacyl radical derived from a mono- or dibasic carboxylic acid, sulphuric acid, a sulphonic acid, a sulphinic acid, phosphoric acid, or a phosphonic acid, and R_2 can represent an unsubstituted or a lower alkyl or phenyl substituted radical selected from the group consisting of carbamoyl, guanyl and guanylcarbamoyl radicals; R_1 and R_2 together with the nitrogen atom can form a monocyclic, saturated ring having from 4 to 81 carbon atoms; furthermore R_1 and R_2 together can represent a radical of the formula



in which R_3 and R_4 each stands for hydrogen, lower alkyl, phenyl or phenyl-lower alkyl, or in which R_3 and R_4 together with the nitrogen atom form a monocyclic, saturated ring having from 4 to 7 carbon atoms; the groupings:



represent saturated, monocyclic, bicyclic or spirocyclic ring systems, respectively, having from 4 to 11 carbon atoms in total; P stands for the penicillanic acid radical of the formula IV:



and salts of the compounds of the formulae I, II, and III with pharmaceutically acceptable, non-toxic organic and inorganic acids or bases, and easily hydrolyzable pharmaceutically acceptable, non-toxic esters of the penicillanic acid derivatives of formulae I, II, and III.

53. A method of treating patients suffering from bacterial infection, which comprises administering to said patients a compound as claimed in claim **1** in daily doses from 0.2 to 30 g calculated as the free acid.

4,229,444
PESTICIDAL O-ALKYL-O-(1,5-DISUBSTITUTED-1,2,4-TRIAZOLYL-(3)-THIONO-PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath-Steinenbrück; Bernhard Homeyer, Opladen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

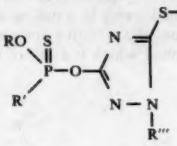
Continuation of Ser. No. 645,971, Jan. 2, 1976, abandoned, which is a division of Ser. No. 430,435, Jan. 3, 1974, abandoned. This application May 18, 1978, Ser. No. 907,388

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1973, 2301400

Int. Cl.[2] **A01N** *9/36;* **C07F** *9/65*

U.S. Cl. 424—200 **5 Claims**

1. An 0-triazolylthionophosphoric acid ester of the formula



in which

R is alkyl of 1 to 6 carbon atoms,

R′ is alkoxy of 1 to 6 carbon atoms,

R″ is a cyanoalkyl of 1 to 4 carbon atoms, and

R‴ is alkyl of 1 to 6 carbon atoms.

3. An insecticidal or acaricidal composition containing an insecticidally or acaricidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,229,445
SYNERGISTIC ARTHROPODICIDAL COMPOSITIONS AND METHODS OF USE

Volker Mues, Wuppertal, and Wolfgang Behrenz, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

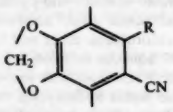
Filed Jul. 12, 1978, Ser. No. 923,872

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734108

Int. Cl.[2] **A01N** *9/36, 9/28, 9/02, 9/12*

U.S. Cl. 424—200 **6 Claims**

1. A synergistic arthropodicidal composition comprising an arthropodicidally effective amount of (a) at least one compound selected from the group consisting of (A) carbamates, (B) carboxylic acid esters, (C) phosphoric and phosphonic acid esters and (D) halogenoalkanes, and an approximately equal weight of (b) a benzodioxole derivative of the formula



in which R represents alkyl with 1 to 6 carbon atoms, alkenyl

with 2 to 8 carbon atoms, alkynyl with 2 to 8 carbon atoms, phenyl or benzyl.

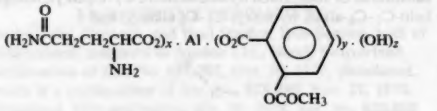
4,229,446

ALUMINUM ACETYLSALICYLATE GLUTAMINATE

Yoshinori Takemoto, Yokkaichi; Toshihiro Yasui; Kyoichi Fujii, both of Sakai; Hiroshi Tanaka, and Tatsuyuki Hirayama, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed Mar. 13, 1979, Ser. No. 20,244
Int. Cl.[2] A01N *37/36;* A61K *31/60*
U.S. Cl. 424—230 **6 Claims**

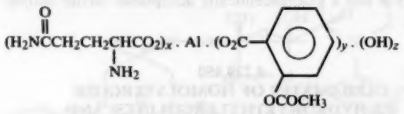
1. An aluminum acetylsalicylate glutaminate represented by the general formula:



wherein x is 1 or 2, y is 1 or 2, z is 0 or 1 and $x+y+z=3$, and hydrates thereof.

5. An antipyritic, analgesic and anti-inflamatory composition which comprises an effective amount of an aluminum acetylsalicylate glutaminate represented by the general formula:

(I)



wherein x is 1 or 2, y is 1 or 2, z is 0 or 1 and $x+y+z=3$, and hydrates thereof and a pharmaceutically acceptable non-toxic carrier or excipient.

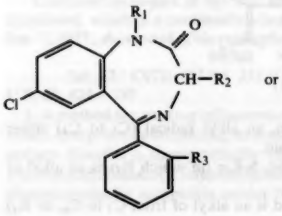
4,229,447

INTRAORAL METHODS OF USING BENZODIAZEPINES

William R. Porter, Etobicoke, Canada, assignor to American Home Products Corporation, New York, N.Y.

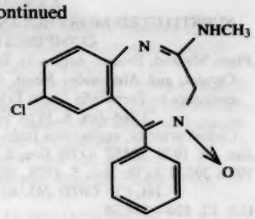
Filed Jun. 4, 1979, Ser. No. 44,430
Int. Cl.[2] A61K *31/33*
U.S. Cl. 424—244 **8 Claims**

1. A method for affecting the human central nervous system by the administration of a benzodiazepine having the formula:



or

-continued



wherein R_1 is hydrogen or lower alkyl, R_2 is hydrogen or hydroxy, and R_3 is hydrogen or chlorine, which comprises sublingually or buccally administering to a human a therapeutically effective amount of said benzodiazepine.

4,229,448

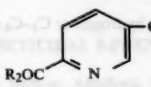
5-SUBSTITUTED PICOLINIC ACID DERIVATIVES AND AN ANTI-HYPERTENSIVE COMPOSITION CONTAINING THE SAME

Yasuharu Sekizawa, Tokyo; Takashi Tsuruoka; Mitsugu Hachisu, both of Kawasaki; Masaji Sezaki, Tokyo; Masashi Miyamoto, Tokyo; Uichi Shibata, Tokyo; Kazuko Mizutani, Yokohama; Shigeharu Inouye, Yokohama; Takemi Koeda, Yokohama; Keizo Shimomura, Tokyo, and Taro Niida, Yokohama, all of Japan, assignors to Meuji Seika Kaisha Ltd., Tokyo, Japan

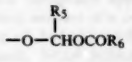
Filed Mar. 23, 1979, Ser. No. 23,504
Claims priority, application Japan, Mar. 24, 1978, 53-32967; Jul. 4, 1978, 53-80485
Int. Cl.[3] A61K *31/455;* C07D *213/79*
U.S. Cl. 424—245 **10 Claims**

1. 5-Substituted picolinic acids and the salts, esters and acid amides thereof represented by the formula (I):

(I)



wherein R_1 represents a straight or branched chain halogen-substituted alkyl group having 2 to 6 carbon atoms; and R_2 represents an —OM group wherein M represents a hydrogen atom, a sodium atom, a potassium atom, a calcium atom, an aluminium atom or a magnesium atom, a straight or branched chain or cyclic alkoxy group having 1 to 6 carbon atoms, an aminoalkoxy group, a phenoxy group, a substituted phenoxy group, a 5-indanyloxy group, an acyloxyalkyloxy group of the formula



wherein R_5 represents a hydrogen atom or a methyl group and R_6 represents a lower alkyl group having 1 to 6 carbon atoms, a phenyl group or a substituted phenyl group, or an amino group represented by the formula

wherein R_7 and R_8, which may be the same or different, each represents a hydrogen atom, a lower alkyl group or a phenyl group.

4,229,449

SUBSTITUTED MORPHOLINE DERIVATIVES AND COMPOSITIONS

Piero Melloni, Bresso; Arturo D. Torre, Gallarate; Giovanni C. Carniel, and Alessandro Rossi, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

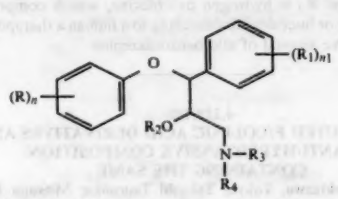
Filed Jan. 8, 1979, Ser. No. 1,604

Claims priority, application Italy, Jan. 20, 1978, 19449 A/78; Jan. 20, 1978, 19450 A/78; Dec. 5, 1978, 30533 A/78; Dec. 5, 1978, 30534 A/78; Dec. 5, 1978, 30535 A/78

Int. Cl.[2] **C07D** *265/30;* **A61K** *31/535*

U.S. Cl. 424—248.58 **9 Claims**

1. A compound having the following formula (I)



(I)

wherein

n and n_1 are independently 1, 2 or 3;

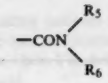
each of the groups R and R_1, which may be the same or different, is hydrogen; halogen; halo-C_1–C_6-alkyl; hydroxy; C_1–C_6 alkoxy; C_1–C_6 alkyl unsubstituted or substituted by one or more substituents chosen from the group consisting of hydroxy, C_1–C_6 alkoxy

wherein R_5 and R_6 are independently hydrogen or C_1–C_6 alkyl and

where R_5 and R_6 are as defined above; phenyl-C_1–C_6-alkyl or phenyl-C_1–C_6-alkoxy in which the phenyl groups may be unsubstituted or substituted by one or more substituents chosen from the group consisting of C_1–C_6 alkyl, halogen, C_1–C_6 alkoxy, hydroxy, halo-C_1–C_6-alkyl and

wherein R_5 and R_6 are as defined above; R_3 is hydrogen; C_1–C_6 alkyl unsubstituted or substituted by one or more substituents chosen from the group consisting of halogen, hydroxy, C_1–C_6 alkoxy,

and



where R_5 and R_6 are as defined above; C_2–C_4 alkenyl, C_2–C_4 alkynyl, phenyl-C_1–C_4-alkyl in which the phenyl group may be unsubstituted or substituted by one or more substituents chosen from the group consisting C_1–C_6 alkyl, halogen, halo-C_1–C_6-alkyl, hydroxy, C_1–C_6 alkoxy and

where R_5 and R_6 are as defined above; C_3–C_7 cycloalkyl unsubstituted or substituted by one or more C_1–C_6 alkyl, halogen, halo-C_1–C_6-alkyl, hydroxy, C_1–C_6 alkoxy; and

where R_5 and R_6 are as defined above;

R_2 and R_4, taken together, from the —CH_2—CH_2— radical, as well as the pharmaceutically acceptable salts thereof

9. An antidepressant composition comprising an antidepressant effective amount of a compound according to any one of claims 1–8 and a pharmaceutically acceptable carrier and/or diluent.

4,229,450

CARBAMATES OF HOMOLYSERGOLS (8β-HYDROHYETHYLERGOLINES) AND COMPOSITIONS THEREOF

Giorgio Ferrari, and Vittorio Vecchietti, both of Milan, Italy, assignors to Simes Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

Filed Jan. 16, 1979, Ser. No. 3,931

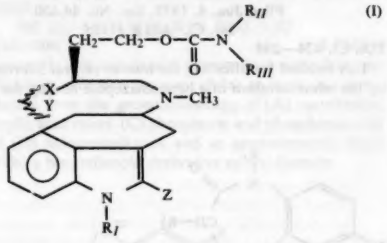
Claims priority, application United Kingdom, Jan. 26, 1978, 3262/78

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.[3] **C07D** *457/02;* **A61K** *31/48*

U.S. Cl. 424—248.52 **27 Claims**

1. Novel ergoline derivatives having the general formula (I)



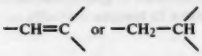
(I)

wherein R_1 is hydrogen, an alkyl radical (C_1 to C_4) either straight or branched chain.

Z is hydrogen, bromine, S-R_{IV} (in which R_{IV} is an alkyl of from C_1 to C_4,

R_{II} is equal to R_{III} and is an alkyl of from C_1 to C_6, or R_{II}

united with R_{III} form pyrrolidine, piperidine, hexamethyleneimine, morpholine or piperazine unsubstituted or N-substituted by C_1 to C_4 alkyl or phenyl, the x—y bridge being a



bond.

20. A pharmaceutical composition having antihypertensive activity, antiasthmatic activity or anti-depressant activity, characterized in that it contains a pharmaceutical carrier and as active principle in an amount effective for said activity a compound according to claim 1, or a parmaceutically acceptable salt thereof.

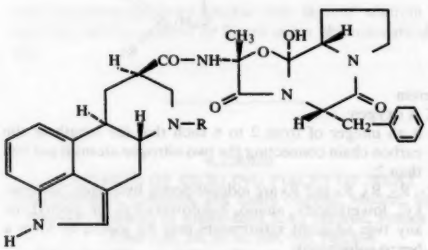
4,229,451
ERGOPEPTINE DERIVATIVES

Theodor Fehr, Dornach, and Paul Stadler, Biel-Benken, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 626,782, Oct. 29, 1975, abandoned, which is a continuation of Ser. No. 525,780, Nov. 21, 1974, abandoned. This application Jun. 29, 1978, Ser. No. 920,480
Claims priority, application Switzerland, Nov. 28, 1973, 16698/73
Int. Cl.³ A01K 31/495; C07D 519/02
U.S. Cl. 424—250 7 Claims

1. A compound of the formula I,

I



wherein R is a branched chain alkyl of 3 to 6 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

4. A pharmaceutical composition useful in treating vascular disorders comprising a therapeutically effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4,229,452
TREATMENT OF INFLAMMATORY DISORDERS WITH 4-TRIFLUOROMETHYLIMIDAZO[1,2-a]QUINOXALINE

Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Williamsville, both of N.Y., assignors to Westwood Pharmaceuticals, Inc.

Continuation-in-part of Ser. No. 858,511, Dec. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 757,640, Jan. 7, 1977, abandoned. This application Jul. 12, 1979, Ser. No. 56,768
Int. Cl.³ C07D 487/04, 233/61; A61K 31/495
U.S. Cl. 424—250 7 Claims

1. A method for treating inflammatory disorders in mammals which comprises administering to a mammal having an inflammatory disorder a therapeutically effective amount of 4-trifluoromethylimidazo[1,2-a]quinoxaline in combination with a pharmaceutically acceptable carrier therefor.

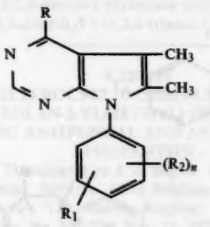
4,229,453
SUBSTITUTED 5,6-DIMETHYLPYRROLO[2,3-d]PYRIMIDINE COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hermann J. Roth, Bad Honnef; Kurt Eger, Bonn-Endenich; Sedika Issa, Leverkusen, and Haireddin Jacobi, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 6, 1979, Ser. No. 28,028
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818676
Int. Cl.² A61K 31/495; C07D 487/04
U.S. Cl. 424—251 13 Claims

1. A 5,6-dimethylpyrrolo[2,3-d]pyrimidine compound of the formula

(I)



or a physiologically acceptable acid-addition salt thereof, in which

R denotes amino or hydroxyl,
R_1 denotes halogen, nitro,
C_1 to C_6 alkyl or trifluoromethyl, and in the case where R is hydroxyl, also denotes hydrogen,
R_2 in each case denotes hydrogen, halogen or C_1 to C_6 alkyl or alkoxy and
n is 1 or 2.

4,229,454
INSECTICIDAL 5-PHENYLCARBAMOYL-BARBITURIC ACID

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 870,242, Jan. 17, 1978, abandoned, which is a continuation of Ser. No. 791,268, Apr. 27, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,588
Claims priority, application Switzerland, May 6, 1976, 5687/76; Nov. 3, 1976, 13850/76; Mar. 30, 1977, 3981/77
Int. Cl.² C07D 239/62
U.S. Cl. 424—254 23 Claims

1. 5-(4-Chlorophenyl)-carbamoyl-1,3-dimethyl-barbituric acid.

18. A method of controlling insect pests at a locus, which method comprises applying to said locus an insecticidally effective amount of a compound selected from the group consisting of: 5-(4-chlorophenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(2,4-dichlorophenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(4-chloro-3-trifluoromethylphenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(4-trifluoromethylphenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(3,5-bis-trifluoromethylphenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(4-bromophenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(4-iodophenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(4-fluorophenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(4-chlorophenyl)-carbamoyl-1,3-diethyl-barbituric acid; 5-(4-bromophenyl)-carbamoyl-1,3-diethyl-barbituric acid; 5-(4-bromophenyl)-carbamoyl-1-methyl-3-isopropylbarbituric acid; 5-(4-trifluoromethylphenyl)-carbamoyl-1,3-diethyl-barbituric acid; 5-(3,5-bis-trifluoromethylphenyl)-carbamoyl-1,3-diethyl-barbituric acid; 5-(3-trifluoromethyl-phenyl)-carbamoyl-1,3-dimethyl-barbituric acid; 5-(2,4-dichlorophenyl)-carbamoyl-

1,3-diethyl-barbituric acid; 5-(4-chloro-3-trifluoromethylphenyl)-carbamoyl-1-methyl-3-ethyl-barbituric acid; and 5-(2,4-dichlorophenyl)-carbamoyl-1-methyl-3-ethyl-barbituric acid.

4,229,455

IMINO-BRIDGED BENZOCYCLOHEPTAPYRIDINES

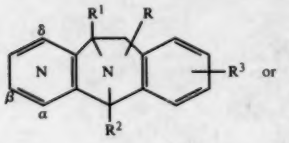
Kenneth L. Shepard, Ambler, and Wasyl Halczenko, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 944,431, Sep. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 860,666, Dec. 15, 1977, abandoned. This application Oct. 18, 1978, Ser. No. 952,354

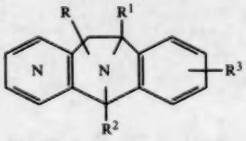
Int. Cl.[2] **C07D** *471/08;* **A61K** *31/44*

U.S. Cl. 424—256 **6 Claims**

1. A compound of structural formula:



or



or a pharmaceutically acceptable salt thereof, wherein R^1 and R^2 are independently

(1) hydrogen,
(2) lower alkyl,
(3) lower alkenyl,
(4) phenyl-lower alkyl,
(5) lower cycloalkyl, or
(6) lower(cycloalkyl-alkyl),

with the proviso that only one of R^1 and R^2 is other than hydrogen;

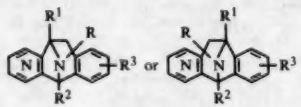
R is

(1) R^2,
(2) phenyl, or
(3) di(lower alkyl)amino-lower alkyl; and

R^3 is

(1) hydrogen,
(2) halogen,
(3) lower alkoxy,
(4) trifluoromethylthio,
(5) cyano, or
(6) carboxy.

5. A pharmaceutical composition comprising a pharmaceutical carrier and an effective amount of a compound of formula:



or a pharmaceutically acceptable salt thereof, wherein R^1 and R^2 are independently

(1) hydrogen,
(2) lower alkyl,
(3) lower alkenyl,
(4) phenyl-lower alkyl,
(5) lower cycloalkyl, or
(6) lower(cycloalkyl-alkyl),

with the proviso that only one of R^1 and R^2 is other than hydrogen;

R is

(1) R^2,
(2) phenyl, or
(3) di(lower alkyl)amino-lower alkyl; and

R^3 is

(1) hydrogen,
(2) halogen,
(3) lower alkoxy,
(4) trifluoromethylthio,
(5) cyano, or
(6) carboxy.

4,229,456

SUBSTITUTED NAPHTHYRIDINONES AND PROCESSES FOR THEIR PREPARATIONS

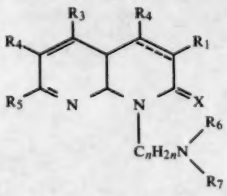
William A. Bolhofer, Frederick; Edward J. Cragoe, Jr., Lansdale, and Jacob M. Hoffman, Jr., North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 816,617, Jul. 18, 1977, Pat. No. 4,133,885. This application Oct. 23, 1978, Ser. No. 954,388

Int. Cl.[3] **C07D** *403/02;* **A61K** *31/44*

U.S. Cl. 424—256 **7 Claims**

1. A compound having the formula:



wherein

X is oxygen;

n is an integer of from 2 to 6 such that the length of the carbon chain connecting the two nitrogen atoms is not less than 2;

R_1, R_2, R_3, R_4 and R_5 are independently hydrogen, loweralkyl, loweralkoxy, amino, halololoweralkyl, or phenyl; or any two adjacent substituents may be joined to form a benzo substituent;

R_6 and R_7 are independently N-loweralkylthiocarbamoyl; or R_6 and R_7 may be joined to form a morpholino ring or R_6 and R_7 may be an alkylene linkage of 4 or 5 carbon atoms to form a pyrrolidine or piperidine group which may be substituted with loweralkyl, oxo or benzo substituents;

and the broken line in the 3,4 position of the naphthyridine molecule indicates that the bond may be either a single or a double bond;

and the acid addition and quaternary ammonium salts thereof;

and those compounds wherein

X is sulfur,

n is an integer of from 2 to 6 such that the length of the carbon chain connecting the two nitrogen atoms is not less than 2;

R_1, R_2, R_3, R_4 and R_5 are independently hydrogen, loweralkyl, loweralkoxy, amino, halololoweralkyl, or phenyl; or any two adjacent substituents may be joined to form a benzo substituent;

R_6 and R_7 are independently hydrogen, phenylloweralkyl, N-loweralkylcarbamoyl, N-loweralkylthiocarbamoyl; or R_6 and R_7 may be joined to form a morpholino ring or R_6 and R_7 may be an alkylene linkage of 4 or 5 carbon atoms to form a pyrrolidine or piperidine group which may be substituted with loweralkyl, oxo or benzo substituents;

and the broken line in the 3,4 position of the naphthyridine

molecule indicates that the bond may be either a single or a double bond;

and the acid addition and quaternary ammonium salts thereof.

7. A method for the suppression of gastric acid secretions which comprises administering to an animal with excess gastric acid secretions, an effective amount of a compound of claim 1.

4,229,457

3-(3-SUBSTITUTED ARYLOXY)-2-YRIDINECARBONITRILES, PHARMACEUTICAL COMPOSITIONS AND METHODS FOR THEIR PRODUCTION

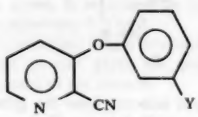
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 960,212, Nov. 13, 1978, abandoned. This application Sep. 27, 1979, Ser. No. 79,408

Int. Cl.[3] **A61K** *31/44*

U.S. Cl. 424—263 **2 Claims**

1. A pharmaceutical composition for treating senility comprising an effective amount of compound of the formula



and pharmaceutically-acceptable salts thereof wherein Y is methoxy, methyl, chloro or fluoro and a pharmaceutical carrier.

4,229,458

METHOD OF PICKLING PIECES OF MEAT

Claude Dreano, Guilliers, and André Noyelle, Muizon, both of France, assignors to Armor-Inox S.A., Mauron, France

Filed Apr. 26, 1978, Ser. No. 900,244

Claims priority, application France, Apr. 27, 1977, 77 13471

Int. Cl.[2] **A23B** *4/02;* **A23L** *1/27, 1/31*

U.S. Cl. 426—264 **5 Claims**

1. A pickling method comprising the steps of:

a. placing in a container pieces of meat to be pickled, said container being mounted for turning about a horizontal axle whereby said meat tumbles into and out of any fluid which may be in the bottom of said container;

b. adding to the said container a quantity of liquid brine which corresponds to the mass of the pieces of meat to be pickled, whereby said meat and brine rest on the bottom of said container when said container is stationary and tumble while said container rotates about said horizontal axle;

c. pressurizing the container with an inert nitrogen gas to a pressure greater than atmospheric pressure and less than 3 bars, whereby space within said container which is not filled with said brine is a pressurized atmosphere of nitrogen;

d. rotating the container;

e. applying a vacuum to the interior thereof;

f. sweeping the container with an inert nitrogen gas; and then

g. reestablishing atmospheric pressure in the container after a predetermined time and stopping said rotation before opening the container.

4,229,459

COMBATING FUNGI WITH 1-AZOL-1-YL-1-PHENOXY-2-ALKANE ETHERS

Wolfgang Krämer; Karl H. Büchel, both of Wuppertal; Wilhelm Brandes, Leichlingen; Paul-Ernst Frohberger, Leverkusen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,401

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720949

Int. Cl.[2] **A01N** *9/22;* **C07D** *233/60, 249/08*

U.S. Cl. 424—269 **7 Claims**

1. A compound selected from the group consisting of 1-(4-chlorophenoxy)-2-methoxy-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butane, 1-(4-biphenylyloxy)-2-ethoxy-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butane, 1-(4-chlorophenoxy)-2-ethoxy-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butane and 1-(4-biphenylyloxy)-2-methoxy-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butane.

4,229,460

HETEROCYCLIC DERIVATIVES OF 1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-1,2,4-TRIAZOLES HAVING ANTIFUNGAL AND ANTIBACTERIAL PROPERTIES

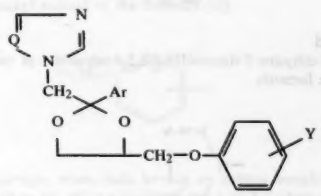
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 853,726, Nov. 21, 1977, Pat. No. 4,160,841, which is a continuation-in-part of Ser. No. 764,265, Jan. 31, 1977, abandoned. This application Jun. 20, 1979, Ser. No. 50,371

Int. Cl.[2] **A01N** *9/22, 9/12;* **C07D** *407/14*

U.S. Cl. 424—269 **3 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



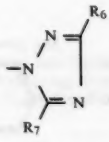
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is N;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

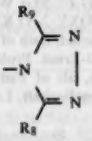
a 1H-1,2,4-triazol-1-yl radical of the formula



(d)

wherein R_6 is selected from the group consisting of hydrogen and lower alkylthio, and, R_7 is selected from the group consisting of hydrogen, lower alkyl and phenyl;

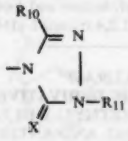
a 4H-1,2,4-triazol-4-yl radical of the formula



(e)

wherein R_8 is selected from the group consisting of hydrogen, lower alkyl, lower alkyloxy, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, and, R_9 is selected from the group consisting of hydrogen and lower alkyl;

a 2,3-dihydro-4H-1,2,4-triazol-4-yl radical of the formula



(f)

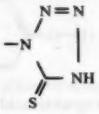
wherein X is selected from the group consisting of O and S, and, R_{10} and R_{11} are each independently selected from the group consisting of hydrogen and lower alkyl, provided that when said X is S then said R_{11} is hydrogen;

a 1H-1,2,3,4-tetrazol-1-yl radical of the formula

(g);

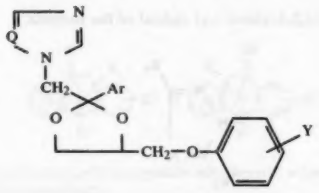
and

a 4,5-dihydro-5-thioxo-1H-1,2,3,4-tetrazol-1-yl radical of the formula



(h).

3. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a compound selected from the group consisting of an azole derivative having the formula:



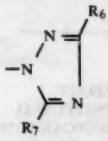
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is N;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

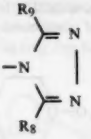
a 1H-1,2,4-triazol-1-yl radical of the formula



(d)

wherein R_6 is selected from the group consisting of hydrogen and lower alkylthio, and, R_7 is selected from the group consisting of hydrogen, lower alkyl and phenyl;

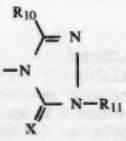
a 4H-1,2,4-triazol-4-yl radical of the formula



(e)

wherein R_8 is selected from the group consisting of hydrogen lower alkyl, lower alkyloxy, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, and, R_9 is selected from the group consisting of hydrogen and lower alkyl;

a 2,3-dihydro-4H-1,2,4-triazol-4-yl radical of the formula



(f)

wherein X is selected from the group consisting of O and S, and, R_{10} and R_{11} are each independently selected from the group consisting of hydrogen and lower alkyl, provided that

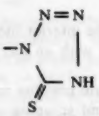
when said X is S then said R_{11} is hydrogen;

a 1H-1,2,3,4-tetrazol-1-yl radical of the formula

(g);

and

a 4,5-dihydro-5-thioxo-1H-1,2,3,4-tetrazol-1-yl radical of the formula



(h).

4,229,461
FUNGICIDAL 6-(3,5-DICHLOROPHENYL)PERHYDROIMIDAZO[5,1-b]THIAZOLE DERIVATIVES

Taichiro Shigematsu, Machida; Kenji Yoshida, Yokohama; Makoto Nakazawa, Sagamihara; Hiroshi Kasugai, Yokohama, and Masataka Tsuda, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

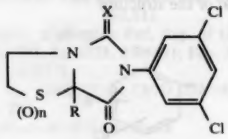
Filed Jun. 18, 1979, Ser. No. 49,620

Claims priority, application Japan, Jun. 30, 1978, 53-79442; Sep. 20, 1978, 53-115372

Int. Cl.[3] C07D *277/60*

U.S. Cl. 424—270 9 Claims

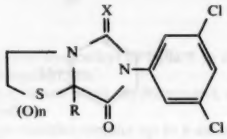
1. 6-(3,5-dichlorophenyl)-perhydroimidazo[5,1-b]thiazole compound represented by the formula (1)



(1)

wherein, R represents hydrogen atom or an alkyl group of 1 through 4 carbon atoms, X represents an oxygen atom or a sulfur atom and n represents 0, 1 or 2.

6. A method of controlling fungal infection on plants which comprises applying to said plants an antifungal effective amount of a compound of the formula



wherein, R represents hydrogen atom or an alkyl group of 1 through 4 carbon atoms, X represents oxygen atom or sulfur atom and n represents 0, 1 or 2.

4,229,462
METHOD FOR CONTROLLING HYPERTENSION AND COMPOSITIONS

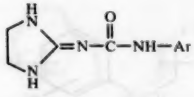
Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Dec. 22, 1978, Ser. No. 972,579

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 R 17 Claims

1. A method which comprises administering to a hypertensive animal, a therapeutically effective antihypertensive amount of a compound selected from the group consisting of (a) an N-aryl-N′-(2-imidazolidinylidene)urea having the formula:



wherein Ar is phenyl substituted with from 0 to 3 substituents independently selected from the group consisting of fluoro, chloro, bromo, methyl, ethyl, methoxy, ethoxy, trifluoromethyl, methylthio, methylsulfonyl, methylsulfinyl and cyano, and (b) a pharmaceutically acceptable salt thereof.

4,229,463
UNSATURATED FATTY ACID HYDRAZIDES

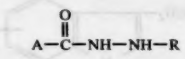
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 27, 1978, Ser. No. 881,780

Int. Cl.[2] A01N *9/22;* A61K *31/40;* C09F *5/00;* C07D *209/12*

U.S. Cl. 424—274 29 Claims

1. A compound which is a hydrazide of the formula:

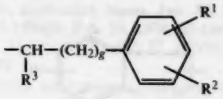


wherein

A is the residue of an unsaturated fatty acid minus the carboxylic function and has from 7 to 23 carbon atoms and has from 1 to 4 ethylenically unsaturated positions; and

R is:

(a) an aralkyl radical of the structure



wherein

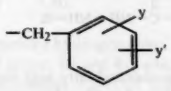
g is 0 or 1;

wherein

R^1 is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms; or alkyl having from 1 to 3 carbon atoms;

R^2 is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

R^3 is a benzyl radical of the formula (iii)



(iii)

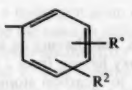
wherein

y is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36;

or R is:

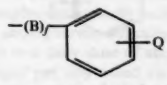
(b) a phenyl radical of the structure



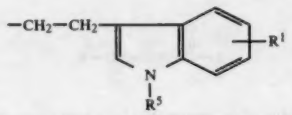
wherein

R^2 is as defined above, and

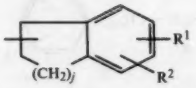
R^0 is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkyl having from 1 to 3 carbon atoms; alkoxy having from 1 to 3 carbon atoms; or a radical of the structure R^f:



in which
B is —CH_2— or —O—;
f is 0 or 1; and
Q is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or R is:
(c) an indolyl radical of the structure:

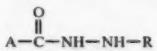


wherein
R^1 is as defined above, and
R^5 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl (unsubstituted);
or R is (d) a benzocycloalkyl nucleus of the structure:

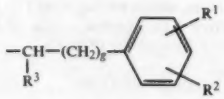


wherein
R^1 and R^2 are as defined above; and
j is a whole integer of from 1 to 4; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

21. A method of reducing the cholesterol ester content of an arterial wall in a mammal in need of such treatment, comprising administering to said mammal a cholesterol ester-reducing amount of a compound which is a hydrazide of the formula:



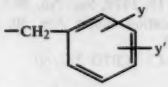
wherein
A is the residue of an unsaturated fatty acid minus the carboxylic function and has from 7 to 23 carbon atoms and has from 1 to 4 ethylenically unsaturated positions; and
R is:
(a) an aralkyl radical of the structure



wherein g is 0 or 1;
wherein
R^1 is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms; or alkyl having from 1 to 3 carbon atoms;
R^2 is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and
R^3 is (i) a hydrogen atom, a phenyl radical of the structure ii):

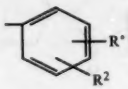
(ii)

wherein
y is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; and
y' is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or
a benzyl radical of the formula (iii)

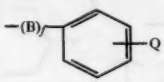


(iii)

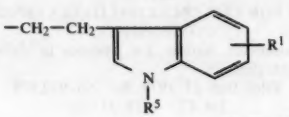
wherein y and y' are as defined above; or iv) alkyl having from 1 to 8 carbon atoms; or R is:
(b) a phenyl radical of the structure



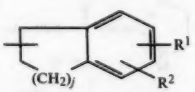
wherein
R^2 is as defined above, and
R^0 is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkyl having from 1 to 3 carbon atoms; alkoxy having from 1 to 3 carbon atoms; or a radical of the structure R^f:



in which
B is —CH_2— or —O—;
f is 0 or 1; and
Q is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or R is:
(c) an indolyl radical of the structure:



wherein
R^1 is as defined above, and
R^5 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl (unsubstituted); or
R is (d) a benzocycloalkyl nucleus of the structure:



wherein
R^1 and R^2 are as defined above; and
j is a whole integer of from 1 to 4; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,229,464
AMINOPROPANOL SUBSTITUTED INDOLE COMPOUNDS AND COMPOSITIONS FOR THE TREATMENT OF CARDIAC AND CIRCULATORY DISEASES

Wolfgang Kampe, Heddesheim, Fed. Rep. of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Fed. Rep. of Germany; by Werner Plattner, administrator, Linz, Austria; Max Thiel, Mannheim, Fed. Rep. of Germany; Wolfgang Bartsch, Viernheim, Fed. Rep. of Germany; Karl Dietmann, Mannheim-Vogelstang, Fed. Rep. of Germany; Egon Roesch, Mannheim, Fed. Rep. of Germany, and Wolfgang Schaumann, Heidelberg, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

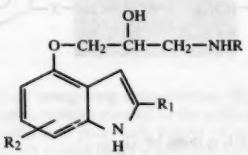
Continuation-in-part of Ser. No. 805,558, Jun. 10, 1977, Pat. No. 4,152,446, which is a division of Ser. No. 626,512, Oct. 28, 1975, Pat. No. 4,076,829. This application Sep. 18, 1978, Ser. No. 943,512

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1974, 2454406; Feb. 11, 1975, 2505681; Feb. 26, 1975, 2508251; Jun. 27, 1975, 2528771

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/18, 209/20*

U.S. Cl. 424—274 **11 Claims**

1. Amino propanol of the formula



(I)

wherein

R is lower alkyl or cycloalkyl of from 3 to 6 carbon atoms

R_1 is pivaloyloxyalkyl, and

R_2 is hydrogen, lower alkyl, hydroxyalkyl, alkoxyalkyl or pivaloyloxyalkyl;

wherein the alkyl moieties contain up to 6 carbon atoms each; and the pharmacologically acceptable salts thereof.

7. Method of combatting or preventing cardiac and circulatory infirmities which method comprises applying to a subject in amounts effective for treatment or prophylaxis of cardiac or circulatory diseases an aminopropanol compound selected from

4-(2-hydroxy-3-tert.-butylamino-propoxy)-2-pivaloyloxymethyl-indole, and

4-(2-hydroxy-3-isopropylamino-propoxy)-2-pivaloyloxymethyl-indole.

4,229,465
CYANOPYRROLE DERIVATIVES

Kazuhiko Ohkuma; Hideo Takagi; Akira Nakata, all of Kanagawa, and Shogo Kosaka, Hatano, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

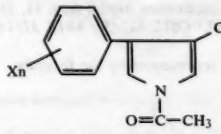
Filed Jul. 6, 1979, Ser. No. 55,321

Claims priority, application Japan, Jul. 10, 1978, 53/83671

Int. Cl.[3] **C07D** *207/44;* **A61K** *31/40*

U.S. Cl. 424—274 **9 Claims**

1. A compound of the general formula



wherein X is chlorine, bromine, methyl or trifluoromethyl, and n is 0, 1 or 2.

7. A method for the control of fungi comprising applying to the locus to be protected an effective amount of a compound of claim 1.

4,229,466
SESQUITERPENE DERIVATIVES HAVING ANTI-COMPLEMENTARY ACTIVITY

Wasei Miyazaki; Hirotsugu Kaise; Yoshimasa Nakano; Taketoshi Izawa; Yasuo Oshiro, all of Tokushima, and Masanao Shinohara, Naruto, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

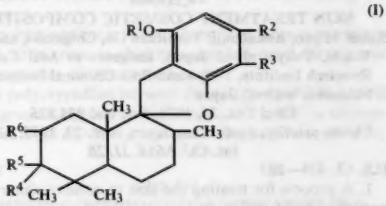
Filed May 15, 1978, Ser. No. 906,300

Claims priority, application Japan, Jun. 30, 1977, 52-78641; Dec. 29, 1977, 52-158959; Feb. 10, 1978, 53-14674

Int. Cl.[3] **A61K** *31/335;* **C07D** *307/77, 307/92;* **A61K** *31/34*

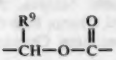
U.S. Cl. 424—279 **6 Claims**

1. A sesquiterpene derivative expressed by the general formula (I):



(I)

wherein R^1 represents a hydrogen atom, a lower alkyl group or a lower alkanoyl group; R^2 and R^3, which may be the same or different, each represents a formyl group, a hydroxymethyl group, a hydroxyl group, a carboxyl group, a lower alkanoyloxymethyl group, or a group having the formula $-CH=CR^7R^8$ in which R^7 and R^8, which may be the same or different, each represents a hydrogen atom, a cyano group, a lower alkoxycarbonyl group or a carboxyl group, or R^2 and R^3 may combine and form a lactone ring of the formula



in which R^9 represents a hydrogen atom or a hydroxyl group; R^4 and R^6, which may be the same or different, each represents a hydroxyl group or a lower alkanoyloxy group; R^5 represents a hydrogen atom; R^4 and R^5 may together form an oxo group; and R^4 and R^6 may combine to form a lower alkylidenedioxy group; or the pharmaceutically acceptable salts thereof.

4. A pharmaceutical composition having anticomplementary activity in animals comprising a therapeutically effective amount of the sesquiterpene derivative or the pharmaceutically acceptable salt thereof according to claim 1 and a pharmaceutically acceptable carrier.

6. A method for treating nephritis, which comprises administering a pharmaceutical composition containing the sesquiterpene derivative or the pharmaceutically acceptable salt thereof according to claim 1 and a pharmaceutically acceptable carrier to a nephritic patient in a daily dose of about 0.5 to about 20 mg/kg of body weight per day based on the sesquiterpene derivative.

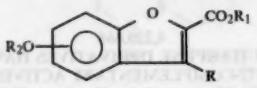
4,229,467

ALKOXY BENZOFURAN CARBOXYLIC ACIDS AND SALTS AND ESTERS THEREOF AS HYPOLIPIDEMIC AGENTS

Roger A. Parker, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Aug. 16, 1979, Ser. No. 67,243
Int. Cl.[2] A61K *31/335;* **C07D** *307/85*
U.S. Cl. 424—285 **10 Claims**

1. A compound of the formula



wherein R is H or C_{1-4} alkyl; R_1 is H or C_{1-4} alkyl; and R_2 is straight or branched chain alkyl of 10–20 carbon atoms, straight or branched chain alkenyl of 10–20 carbon atoms, straight or branched chain alkadienyl of 10–20 carbon atoms or straight or branched chain alkatrienyl of 10–20 carbon atoms, and the pharmaceutically acceptable salts thereof.

10. A method of lowering serum lipids in a mammal which comprises administering thereto an amount of a compound of claim **1** effective to lower significantly the serum lipids thereof.

4,229,468

SKIN TREATMENT COSMETIC COMPOSITION

Kohei Miyao, Kokubunji; Yoshitaka Ito, Chigasaki, and Tsuneo Wachi, Tokyo, all of Japan, assignors to Asai Germanium Research Institute, Tokyo and Pola Chemical Industries, Inc, Shizuoka, both of, Japan

Filed Oct. 26, 1978, Ser. No. 954,825
Claims priority, application Japan, Nov. 22, 1977, 52/139427
Int. Cl.[2] A61K *31/28*
U.S. Cl. 424—287 **9 Claims**

1. A process for treating the skin to remove abnormal pigmentation and wrinkles and smooth the skin which comprises applying to the skin of patients a cosmetic preparation containing from 0.01 to 5 wt.% thereof of a compound selected from the group consisting of carboxyethyl germanium sesquioxide of the formula $(Ge.CH_2CH_2.COOH)_2O_3$, and its alkali metal, or ammonium salts.

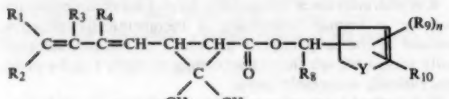
4,229,469

INSECTICIDAL ALKADIENYLCYCLOPROPANECARBOXYLATES

Toshio Mizutani, Toyonaka; Nobushige Itaya; Nobuo Ohno, both of Ikeda; Takashi Matsuo, Amagasaki; Shigeyoshi Kitamura, and Yositosi Okuno, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Division of Ser. No. 265,494, Jun. 23, 1972, Pat. No. 3,954,814.
This application Dec. 22, 1975, Ser. No. 642,920
Claims priority, application Japan, Jun. 28, 1971, 46-47444
Int. Cl.[2] A01N *9/20;* **C07C** *121/75*
U.S. Cl. 424—304 **18 Claims**

1. A compound of the formula,



wherein R_1, R_2, R_3 and R_4 are respectively hydrogen atom or methyl, R_8 is cyano, R_9 is hydrogen atom, a halogen atom or methyl, R_{10} is a halogen atom, methyl, allyl, propargyl, benzyl, phenoxy, methyl-, methoxy- or chlorine-substituted phenoxy or phenylthio, or R_9 and R_{10} are bonded at the ends to form trimethylene or tetramethylene, Y is —CH=CH— and n is 1 or 2.

16. A process for controlling insects, characterized by contacting the insects with an effective amount of the compound according to claim **1**.

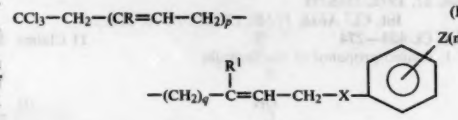
4,229,470

COMPOUNDS HAVING A TRICHLOROMETHYLIC END GROUP HAVING A JUVENILE HORMONE ACTION ON INSECTS AND ACARICIDE ACTIVITY

Paolo Piccardi, and Angelo Longoni, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 731,047, Oct. 8, 1976, Pat. No. 4,140,794.
This application Jan. 17, 1979, Ser. No. 4,263
Claims priority, application Italy, Oct. 9, 1975, 28116 A/75
Int. Cl.[2] A01N *9/20, 9/24;* **C07C** *43/28, 121/75*
U.S. Cl. 424—304 **13 Claims**

1. Compounds of the general formula:



(I)

wherein:

R=H; CH_3

R^1=CH_3; C_2H_5

p=0; 1

q=1; 2 (when p=1, q must be 1);

X=O; S

n=1; 2; 3

Z=H; halogen; alkyl containing 1–5 carbon atoms; alkoxyl containing 1–5 carbon atoms; C_1–C_5 thioalkyl; C_1–C_5 carboalkyl; C_1–C_5 carboxyalkyl; NO_2; phenyl;

(wherein R_2 and R_3, the same or different, are H or a C_1–C_5 alkyl); or CN.

12. The method of combatting noxious insects, which comprises spreading a composition comprising a carrier and the essential constituent of which is at least one compound of formula (I) of claim **1**, in an amount of at least 0.01 p.p.m., or in an amount of at least 0.002 γ/insect, on the insects, the habitat thereof, the food thereof, the eggs thereof, the pupae or larvae, or the food of the pupae or larvae.

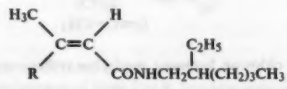
4,229,471

N-(2-ETHYLHEXYL)-CROTONAMIDES

Atsushi Ichikawa, Takatsuki; Kenkichi Tomita, Kyoto; Taku Horiuchi, Ninomiya; Shin-ichi Suzuki, Shizuoka, and Akira Sakuma, Kamakura, all of Japan, assignors to The Lion Dentifrice Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,815
Claims priority, application Japan, Aug. 11, 1978, 53-97889
Int. Cl.[2] C07C *103/56;* **A61K** *31/16*
U.S. Cl. 424—320 **4 Claims**

1. A compound represented by the formula:

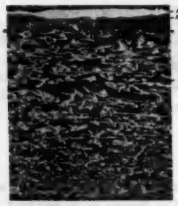


wherein R is selected from the group consisting of hydrogen and methyl.

4,229,472
SHEET MATERIAL

Stuart P. Suskind, Montclair, and Stanley G. Sova, Clifton, both of N.J., assignors to Inmont Corporation, New York, N.Y.

Division of Ser. No. 616,714, Sep. 9, 1974, Pat. No. 4,076,879, which is a continuation-in-part of Ser. No. 512,265, Oct. 4, 1974, abandoned. This application Feb. 24, 1978, Ser. No. 881,102
The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.
Int. Cl.[3] B32B *5/12, 7/02*
U.S. Cl. 428—113 10 Claims

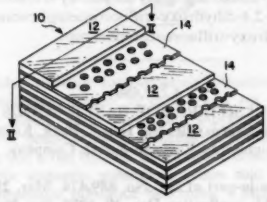


1. A sheet comprising criss-crossing fibers, of elastomeric polyurethane, running parallel to the surfaces of the sheet, said sheet containing a polymeric binder of elastomeric polyurethane adhered to said fibers within said sheet, the weight ratio of said binder to said fibers being in the range of about 1:10 to 6:10, said fibers being bonded together at their points of contact, the pores of said sheet constituting about 2/5 to 182 of the volume of said sheet, the proportion and position of said binder being such that the interior of said sheet has a structure of said criss-crossing fibers running parallel to the surfaces of the sheet with open pathways between intersecting fibers and there are bodies of said binder which each surround, and are firmly bonded to, a plurality of overlying intersecting fibers in the interior of said sheet.

4,229,473
PARTIAL INTERLAMINAR SEPARATION SYSTEM FOR COMPOSITES

Wolf Elber, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 24, 1978, Ser. No. 889,671
Int. Cl.[3] B32B *3/10, 5/12, 27/12*
U.S. Cl. 428—113 6 Claims

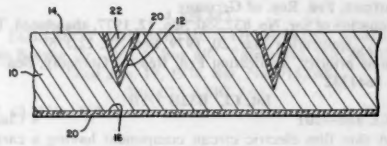


1. A composite laminate having improved fracture resistance comprising:
- a plurality of prepreg tape segments vertically stacked with controlled fiber orientation in each stacked layer and cured into a composite laminate;
- at least one layer of a thin perforated polyester foil film disposed between two adjacent layers of prepreg tape and wherein the adjacent prepreg tape layers are permanently bonded to each other through the perforations in said polyester foil film when the laminate is cured, said laminae being otherwise essentially unbonded.

4,229,474
BREAKAGE RESISTANT V-GROOVED <100> SILICON SUBSTRATES

Alan L. Harrington, Glendale, Calif., assignor to TRW Inc., Los Angeles, Calif.

Division of Ser. No. 959,519, Nov. 13, 1978, Pat. No. 4,191,988. This application May 25, 1979, Ser. No. 42,983
Int. Cl.[3] H01L *21/302, 21/314*
U.S. Cl. 428—162 4 Claims

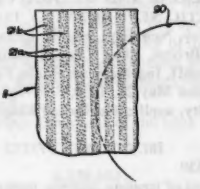


1. A crystalline semiconductive wafer comprising a plurality of V-grooves which are aligned to enable the separation of semiconductive crystals by breaking of the wafer along the V-grooves;
- a thin polycrystalline intrinsic silicon layer, of approximately 7 to 10 microns in thickness, applied onto the top and bottom sides of the substate; and
- a thick polycrystalline intrinsic silicon layer, sufficient to fill the grooves, applied over the thin polycrystalline intrinsic silicon layer on the top, the grooved side, of the substrate.

4,229,475
PERMEABLE DRYER CYCLE FABRIC SOFTENER SHEET

John H. Barrett, La Mirada, and Brian P. Flynn, Long Beach, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Continuation of Ser. No. 840,102, Oct. 6, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,698
Int. Cl.[2] B32B *3/10*
U.S. Cl. 428—196 6 Claims



1. A fabric conditioning means adapted for use in a clothes dryer to allow substantially unrestricted hot airflow to the dryer exhaust duct in all positions of said means in the dryer, said means comprising
- (a) a continuous and interstitially impregnatable air-permeable carrier sheet,
- (b) a fabric conditioner composition on the sheet,
- (c) said conditioner defining local substantially regularly distributed concentrations thereof impregnating and occluding interior interstitial spaces in certain regions of the sheet interior to block airflow therethrough, the sheet with said conditioner characterized as having greater air permeability at other sheet interior regions located adjacent to and between said concentrations than at said con-

centrations, said other regions of the sheet characterized by interstitially open spaces,

(d) said interstitially open spaces in said other sheet regions characterized as relatively larger spaces from which said conditioner has been removed by fluid streams, there being additional interstitial spaces in said other regions which are relatively smaller and which contain remanent conditioner.

4,229,476

THIN FILM STRUCTURE ON A RIBBON SUBSTRATE FOR ELECTRIC COMPONENTS AND MANUFACTURE THEREOF

Herbert Förster, Remshalden, and Dieter Bayer, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 832,350, Sep. 12, 1977, abandoned. This application Mar. 20, 1979, Ser. No. 22,375

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 2641232

Int. Cl.[3] **B32B** *3/10*

U.S. Cl. 428—201 **4 Claims**

1. A thin film electric circuit component having a carrier substrate of insulating material, a film of vapor-deposited oxide on at least one surface of said substrate and a film of metal thereover and having the improvement consisting in that:

said substrate is a ribbon or tape of a material selected from the group consisting of paper and synthetic resin;

said oxide is directly deposited on said substrate in contact therewith and is selected from the group consisting of the oxides of elements aluminum, magnesium, bismuth, antimony, lead, cadmium, tungsten, molybdenum, beryllium, indium, titanium, barium, chromium, zircon, nickel, cobalt, manganese, silicon and boron and mixed oxides of a plurality of said elements;

said metal film is directly deposited on said oxide film wherever the latter covers said substrate and is a film of metal selected from the group consisting of aluminum, zinc, cadmium and mixed zinc and cadmium; and

said metal oxide only partly covers, in patches or islands thereon, the surface or surfaces of said substrate on which it is overlain by said metal film, whereas said metal film fully covers said substrate surface or surfaces.

4,229,477

PHARMACEUTICAL COMPOSITIONS CONTAINING BROMHEXINE AND METHOD OF TREATING DIABETIC NEPHROPATHY THEREWITH

Julian H. Shelley, Newbury; John R. Clamp, and Martin Hartog, both of Bristol, all of England, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed May 25, 1979, Ser. No. 42,286

Claims priority, application United Kingdom, May 26, 1978, 23189/78

Int. Cl.[3] **A61K** *31/135*

U.S. Cl. 424—330 **3 Claims**

1. The method of treating diabetic nephropathy in a human patient, which comprises administering to said patient an effective amount of N-(2-amino-3,5-dibromo-benzyl)-N-methylcyclohexylamine or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,229,478

NAPHTHAQUINONE ANTI-PSORIATIC AGENTS

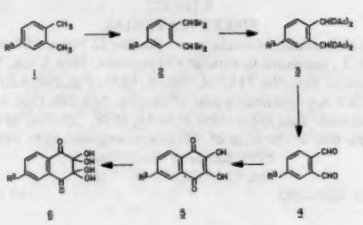
Gordon H. Jones, Cupertino, and John Young, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

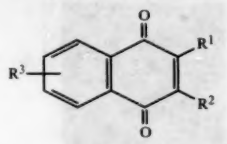
Filed Jun. 5, 1978, Ser. No. 912,697

Int. Cl.[2] **A61K** *31/12*

U.S. Cl. 424—331 **8 Claims**

1. A method for relieving the condition of psoriasis which comprises topically administering to mammals in need thereof an amount of a compound of the formula





(I)

where R^1 and R^2 are the same or different and are hydrogen, hydroxy or C_1 to C_{18} linear or branched alkoxy and R^3 is hydrogen, halo, cyano or C_1 to C_{18} linear or branched alkoxy, with the proviso that R^1 and R^2 are not both hydrogen, sufficient to relieve the condition of psoriasis in mammals in combination with a pharmaceutically acceptable, non-toxic carrier suitable for said administration form.

4,229,479

FLUORACYLRESORCINOLS AS INGREDIENTS IN PHARMACEUTICAL, COSMETIC AND PESTICIDAL COMPOSITIONS

Rolf Brickl; Hans Eberhardt; Karl-Richard Appel, all of Biberach; Uwe Lechner, Ummendorf, and Walter Merk, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 786,266, Apr. 11, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 937,991

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616478

Int. Cl.[3] **A01N** *35/00;* **A61K** *31/12*

U.S. Cl. 424—331 **1 Claim**

1. The method of inhibiting the growth of bacteria and fungi, which comprises contacting said bacteria and fungi with an effective amount of a composition consisting essentially of an inert pharmaceutical carrier and from 1 to 10% by weight, based on the total weight, of at least one compound selected from the group consisting of 2,4-dihydroxy-trifluoroacetophenone, 5-ethyl-2,4-dihydroxy-trifluoroacetophenone and 3-ethyl-2,4-dihydroxy-trifluoroacetophenone.

4,229,480

EMULSIFIERS FOR BAKED GOODS

James L. Suggs, Greeneville, and Dan F. Buck, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

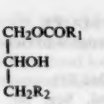
Continuation-in-part of Ser. No. 889,474, Mar. 28, 1978, abandoned. This application Dec. 29, 1978, Ser. No. 974,286

Int. Cl.[2] **A21D** *2/16*

U.S. Cl. 426—24 **16 Claims**

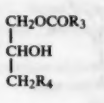
1. A free-flowing wettable powder, substantially all of the particles of which consist essentially of esters of fatty acids in solid solution, said esters consisting essentially of

(a) from about 25% to about 75% by weight of at least one saturated ester of the formula



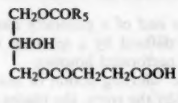
wherein R_1 is the residue of an (even numbered) straight chain saturated fatty acid having from 8 to 22 carbon atoms and R_2 is OH or H,

(b) from about 10% to about 75% by weight of at least one unsaturated ester of the formula



wherein R_3 is the residue of an (even numbered) straight chain unsaturated fatty acid having from 8 to 22 carbon atoms and R_4 is OH or H, and

(c) from 0 to about 65% by weight of a succinylated monoglyceride of the formula



wherein R_5 is the residue of an even numbered straight chain saturated fatty acid having from 8 to 22 carbon atoms,

said esters being at least 40% monoesters and having an iodine value of from about 5 to about 33.

4,229,481

PROCESS AND MEANS TO MAKE AROMATIC INFUSIONS

Hector C. Fornari, 615 Mexico St., Buenos Aires, Argentina

Continuation-in-part of Ser. No. 725,453, Sep. 22, 1976, abandoned. This application Jun. 16, 1978, Ser. No. 916,302

Int. Cl.[2] B65B *29/02*

U.S. Cl. 426—77 **12 Claims**

2. A sachet package for preparing infusions of particulate aromatic substances such as coffee and tea comprising an elongated closed water permeable supporting and filtering container of predetermined dimensions which in a state of immersion has a flat bottom, and a predetermined quantity of an infusable aromatic substance within said container, the infusable aromatic substance becoming a saturated and self-compacted infusable mass upon immersion; the volume relationship between the inside of the container and said saturated self-compacted infusable mass is such that the volume of said infusable mass is not greater than one half of the total volume of the container in an operating immersed state so that the container contains, in a state of immersion, in a vessel containing liquid to be infused, a liquid mass of not less than double the volume which the infusable mass achieves when it is saturated and self-compacted inside the container, the infusable substance being provided in such a quantity that, in a state of saturated mass and spontaneously compacted in the infusion liquid and inside the container it is capable of achieving a smaller thickness than its minimum critical thickness in height of irreversible self-compactness, such smaller thickness, which is of reversible self-compactness, corresponding to all spontaneous states of thickness at or under which the mass of infusable substance maintains its natural capacity for the state of saturation and immersion in the infusion liquid and allows the particles of the substance to separate as a result of the dynamic action of the infusion liquid when the liquid enters into the container through the walls and bottom of the container upon the container being immersed in the liquid in said vessel.

4,229,482

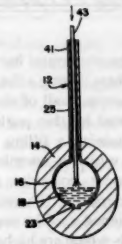
LOLLIPOP AND METHOD OF MAKING SAME

Alvin Kreske, Jr., Rte. 5, Box 407, Valparaiso, Ind. 46383

Filed Jun. 19, 1978, Ser. No. 916,568

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—134 **9 Claims**



1. A method of making a lollipop comprising;

providing a hollow elongated liquid tight rigid stick member open at both ends and having an enlarged hollow portion at one end thereof providing a cavity;

covering the entire exterior surface of the enlarged hollow end portion and opening at said one end with a hard candy body, dissolvable in the mouth, thereby sealing the opening at said one end with said body to make the cavity liquid tight;

thereafter displacing the air from the cavity and interior of the stick member with liquid comestible flavoring material by flowing such material through the open other end of the stick member and into the interior of the stick member including the cavity, said stick member and cavity being constructed of a material impermeable to the liquid flavoring material; and

then sealing the open other end of the stick member.

4,229,483

COLORING MATTER FOR FOODS

Maremi Oura, Takaishi; Haruo Tsumura, Osaka, and Hayato Kubota, Izumi, all of Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan

Filed Dec. 14, 1978, Ser. No. 969,261

Claims priority, application Japan, Jan. 10, 1978, 53-1813

Int. Cl.[2] A23L *1/275*

U.S. Cl. 426—250 **8 Claims**

1. A coloring matter for foods consisting essentially of shea nut meal having a particle size of not more than 100 microns, which is produced by treating shea nut meal with a medium selected from the group consisting of water and 10–99% (W/V) aqueous ethanol solution at 10°–80° C., said water and aqueous ethanol solution being used in an amount of more than

2.5 times and 0.05 to 5 times, respectively, as much as the volume of the shea nut meal to be treated.

4,229,484

PROCESS FOR THE PRODUCTION OF CENTER-FILLED BARS OF CONFECTIONERY

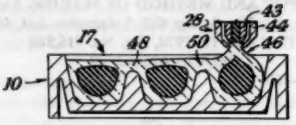
Gordon Steels, Peterborough, and Raymond G. Dacey, Hemel Hempstead, both of England, assignors to Baker Perkins Holdings Limited, Hertfordshire, England

Filed Mar. 27, 1979, Ser. No. 24,451

Claims priority, application United Kingdom, Apr. 11, 1978, 14178/78

Int. Cl.³ A23G 3/00

U.S. Cl. 426—279 2 Claims



1. A process for the production of bars of centre-filled confectionery, each of said bars having a flat base of shell material and a number of protuberances all of shell material, said protuberances being separated by thin portions of said base and each protuberance containing a filling of material different from the shell material which is completely enclosed by the shell material, which process comprises moving in succession into position beneath a depositor the cavities of a mould containing a plurality of aligned cavities separated by webs and having side and end walls which are higher than said webs, and delivering from said depositor into each of said cavities without relative movement between the depositor and the cavity a globular deposit, consisting of filling material totally enclosed by shell material, in an amount sufficient to cause shell material only of said deposit to overflow from said cavity onto the web separating said cavity from an adjoining unfilled cavity, successive deposits being made in sufficiently rapid succession for the overflowing portions of shell material on said webs to join together to form the flat base of a bar.

4,229,485

GLAZED LIVER COATED BISCUIT OR KIBBLE FOR PETS

Bruce W. Brown; Virgil E. Copple, and Carroll K. Wilson, all of El Paso, Tex., assignors to Jerky Treats, Inc., El Paso, Tex.

Filed Jul. 25, 1978, Ser. No. 927,798

Int. Cl.² A23K 1/00

U.S. Cl. 426—305 14 Claims

1. The method of making a pet food product, comprising:

heating a dry, solid edible core, formed of at least 40 weight percent of farinaceous material to a temperature of at least 200° F.;

applying to said core while at a temperature of at least 200° F., a slurry of comminuted liver at a substantially lower temperature, containing, on a dry weight basis, at least 50% by weight of liver, to form a coating containing at least 50% by weight of liver, on said core; and

baking said coated core at a temperature of at least 350° F. to reduce the moisture content thereof to a range of between 8% and 18% by weight to form a continuous glaze of said coating encapsulating said core.

4,229,486

METHOD OF DEGERMING MAIZE

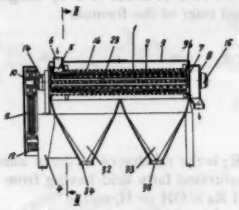
Roman Muller, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Filed Sep. 21, 1978, Ser. No. 944,321

Claims priority, application Switzerland, Sep. 30, 1977, 11958/77

Int. Cl.³ A23L 1/172

U.S. Cl. 426—483 17 Claims



1. The method of degerming maize which comprises the steps of:

(a) introducing maize into one end of a generally annular working chamber which is defined by a spinning rotor which is contained within a perforated housing;

(b) subjecting the maize to the whirling action of not less than about 60 blades carried by the rotor, the blades having two sides which extend along the blades from the vicinity of the housing in the direction of the rotor and having a flattened profile at their outer end and of sufficient thickness to provide two degerming edges on each side of the blade;

(c) allowing the maize to remain in the annular working chamber for a time sufficient to permit the blades to separate the germ from the endosperm of at least a portion of the maize, wherein the separated germ passes out of the working chamber through the perforated housing; and

(d) recovering the degermed maize and the remaining portion of the maize which was not degermed in the annular working chamber at the other end of the working chamber.

4,229,487

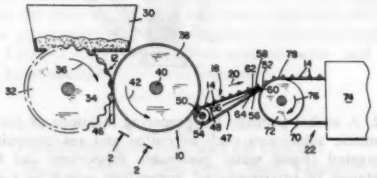
METHOD AND APPARATUS TO MAKE COOKIES

William G. Crothers, Princeton, N.J., assignor to Deer Park Baking Co., Hammonton, N.J.

Filed May 2, 1979, Ser. No. 35,313

Int. Cl.² A21D 6/00

U.S. Cl. 426—496 18 Claims



17. A process for making a cookie comprising:

(a) forming dough into individual cookie bits;

(b) transferring the bits by a transfer conveyor means for moving the bits between a first location where the bits are received on a transfer surface to a second location above said first location where said bits are removed from the transfer surface; and

(c) transferring the bits to an oven conveyor means directly adjacent to and extending above said transfer conveyor

means where said bits are received directly from said transfer conveyor means so that said bits are at the height of the second location as the bits are received on said oven conveyor means.

4,229,488

PASTA CONDITIONER

James L. Suggs, Greeneville, and Dan F. Buck, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 939,301, Sep. 5, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,669
Int. Cl.[2] A23L *1/16, 1/216*
U.S. Cl. 426—557 16 Claims

1. A water dispersible powder adapted for use as a starch complexing agent in pasta and potato product, the particles of which consist essentially of,

(a) from about 85 to about 95% of at least one saturated monoester of the formula

$$\begin{array}{l} CH_2OCOR_1 \\ | \\ CHOH \\ | \\ CH_2R_2 \end{array}$$

wherein R_1 is the residue of a vegetable oil even numbered straight chain saturated fatty acid having from 8 to 22 carbon atoms and R_2 is OH or H, and

(b) from about 15% to about 5% of at least one saturated monoester of the formula

$$\begin{array}{l} CH_2OCOR_3 \\ | \\ CHOH \\ | \\ CH_2R_4 \end{array}$$

wherein R_3 is the residue of a vegetable oil even numbered straight chain unsaturated fatty acid having from 8 to 22 carbon atoms and R_4 is OH or H, the percentages of which are based on the total monoglyceride content of the powder.

4,229,489

COLD-WATER DISPERSIBLE, GELLING STARCH

Chung W. Chiu, Princeton, and Morton W. Rutenberg, North Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 29, 1979, Ser. No. 43,040
Int. Cl.[2] A23L *1/195*
U.S. Cl. 426—578 9 Claims

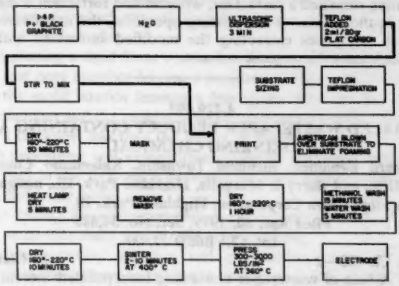
1. A cold-water dispersible, modified tapioca starch with gelling properties, prepared by drum-drying a tapioca starch which has been reacted with a crosslinking agent such that the crosslinked starch has a peak Brabender viscosity of from about 250 to about 850 B.U. and reaches peak viscosity from 50° C. in about 22 to 65 minutes, the crosslinked starch being thereafter converted such that the crosslinked, converted starch has a Brabender Viscosity Differential, measured between 80° and 95° C., of from about −40 to about +55% and has a minimum Brabender viscosity at 80° C. of about 100 B.U., said starch after drum drying being capable of forming a gel having a Bloom strength of at least 50 grams.

4,229,490

NOVEL METHOD FOR CATALYST APPLICATION TO A SUBSTRATE FOR FUEL CELL ELECTRODES

Steven N. Frank, McKinney, and James G. Frank, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 1, 1978, Ser. No. 938,748
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—113 9 Claims



1. The method of making an improved fuel cell electrode comprising the steps of selecting and sizing a thin porous graphitized carbon member, impregnating said member with Teflon, drying said member, mixing platinum black and minute particles of graphite in a ratio of about one part platinum black to four parts graphite, adding a solution in the ratio of about 44 milliliters of Triton X-100 (Octyl phenoxy polyethoxy ethanol) and 20 milliliters of water for each 20 grams of the platinum black/graphite to produce a first mix, adding about 12 milliliters of Teflon 30 to each 20 grams of said first mix to produce a second mix, blending said second mix, screen printing said second mix upon a major surface of the member to produce a coating comprising platinum black catalytic material and finely divided graphite, drying said coating and sintering said coating.

4,229,491

PROCESS FOR PRODUCING CADMIUM STANNATE LAYERS

Helmut Dislich, Budenheim; Paul Hinz, and Günther Wolf, both of Mainz, all of Fed. Rep. of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 969,077
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755468
Int. Cl.[2] B05D *1/18, 3/02, 3/04*
U.S. Cl. 427—160 9 Claims

1. In a dipping process for the production of cadmium stannate layers on a substrate, the improvement which comprises:

(a) dipping said substrate into an alcoholic solution of a reaction product containing cadmium and tin derived from a cadmium compound and a tin compound, said solution consisting essentially of compounds having hydrolyzable and pyrolyzable residues;

(b) withdrawing the substrate from said solution in an atmosphere sufficiently humid for the subsequent hydrolysis; and

(c) gradually heating the coated substrate to 650° C., whereby hydrolysis and pyrolysis removes said residues from the coated substrate to form a coated substrate in which the molar ratio Cd:Sn corresponds to that of said alcoholic dipping solution.

4,229,492
CONTROL OF AUTODEPOSITION BATHS

Harry M. Leister, Ambler; Joseph C. Donovan, Drexel Hill, and Wilbur S. Hall, Plymouth Meeting, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Dec. 30, 1977, Ser. No. 866,053
Int. Cl.[2] B05D *1/40, 1/18*
U.S. Cl. 427—345 **4 Claims**

1. In an autodepositing coating process wherein an aqueous acidic coating composition having dispersed therein a coating forming resin and a surfactant, wherein said surfactant is modified in the course of the coating operation, the improvement which comprises extracting the modified surfactant with a water immiscible organic solvent.

4,229,493
BALED WASTEPAPER PRODUCT CONTAINING A DEINKING CHEMICAL

Bernard Bendiner, Richland Township, Kalamazoo County, Mich., and Barry I. Margolis, Highland Park, Ill., assignors to Fibre-Chem Corporation, Highland Park, Ill.

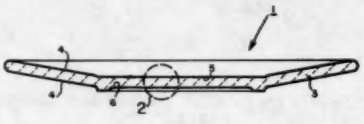
Filed Apr. 30, 1979, Ser. No. 34,685
Int. Cl.[3] B65D *71/00*
U.S. Cl. 428—2 **11 Claims**

1. A bale of wastepaper containing incorporated therein an effective amount of water-soluble or water-dispersible deinking chemical for deinking said wastepaper, said deinking chemical consisting essentially of synthetic organic surface active agent effective to disperse ink present on the wastepaper in the form of very small ink particles when the bale of wastepaper is deinked and pulped in an aqueous alkaline bath.

4,229,494
CERAMIC UTENSILS

William B. Crandall, Alfred Station, and Linda J. Wasserstein, Rockville Centre, both of N.Y., assignors to Alfred University Research Foundation, Inc., Alfred, N.Y.

Division of Ser. No. 874,141, Feb. 1, 1978, Pat. No. 4,155,788.
This application Jan. 31, 1979, Ser. No. 7,951
The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.
Int. Cl.[2] A21D *8/06;* **A23L** *1/00;* **C04B** *35/14*
U.S. Cl. 428—35 **6 Claims**



1. A ceramic utensil having a non-sticking food-contacting surface for use in the preparation and/or serving of foodstuffs, comprising a shaped, fired body having a non-porous, fired Alfred shale terra sigillata coating on at least the food-contacting surfaces thereof, said body having been prepared by firing a green clay composition comprising a shale having approximately the following chemical analysis:

Ingredient	Ave. % by Weight
SiO_2	61.2
Al_2O_3	19.6
Fe_2O_3	7.4
MgO	1.3
CaO	0.4
TiO_2	1.0
Na_2O	1.4
K_2O	3.7
Loss on ignition	4.0
	100.0

and said Alfred shale terra sigillata coating having been prepared by firing on said body a coating composition which has approximately the following formulation:

Ingredient	% by Weight
Alfred shale (ground)	20 to 40
Dispersing agent	0.01 to 1.0
Water	60 to 80

5. In a method for cooking a foodstuff, the improvement wherein said foodstuff is cooked in a non-sticking cooking utensil comprising a fired body of Alfred shale having at least the food-contacting surface of said utensil coated with a non-porous dried layer of Alfred shale terra sigillata, said Alfred shale terra sigillata coating of said utensil having been prepared by firing on said body a coating composition having approximately the following formulation:

Ingredient	% by Weight
Alfred shale (ground)	20 to 40
Dispersing agent	0.01 to 1.0
Water	60 to 80

4,229,495
COATING METHOD AND ARTICLE PRODUCED THEREBY

Minoru Takahashi, Uji; Osamu Ishii, Takatsuki; Masanori Naito; Yoshinobu Kusuhara, both of Mishima, and Naofumi Imahigashi, Takatsuki, all of Japan, assignors to Seikisui Kagaku Kogyo Kabushiki Ltd., Osaka, Japan

Division of Ser. No. 825,835, Aug. 18, 1977, Pat. No. 4,172,734.
This application Dec. 20, 1978, Ser. No. 971,301
Claims priority, application Japan, Aug. 23, 1976, 51-100796
Int. Cl.[2] F16L *58/06, 58/10*
U.S. Cl. 428—36 **14 Claims**

1. A coating method which comprises applying a primer dispersion to the surface of a metallic substrate to be coated, the primer dispersion being a dispersion of a mixture of aluminum powder and zinc powder the weight ratio of the aluminum powder to the zinc powder being 95:5 to 70:30 in a solution of at least one organic solvent-soluble C_{1-4}-alkyl silicate in an organic solvent, the weight ratio of the metal powder to the alkyl silicate being 60:40 to 95:5; baking the coating; coating a finishing powder paint on the resulting primer; and then baking the finish coating.

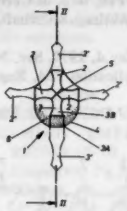
4,229,496
DECORATIVE LINKWORK

Oskar Striegel, Illingen-Schützingen, Fed. Rep. of Germany, assignor to Friedrich Münch Silber-und Alpaccawarenfabrik, Mühlacker, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,649
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2818021
Int. Cl.[2] B32B *3/00, 7/08*
U.S. Cl. 428—53 **4 Claims**

1. Decorative linkwork or mesh sheet formed of plates having outwardly extending arms, each of said outwardly extending arms being formed into U-shaped hook formations with the inner end of each arm extending inwardly of the outer edges of the plate, a separate interconnecting ring means engaging each of the U-shaped hook configurations of the arms of each of said plates, at least one of said outwardly extending arms being folded back inwardly from the edge of the plate and in contigu-

ous contact with the rear surface of the plate for a predetermined length to form a spacing between the edge of the plate



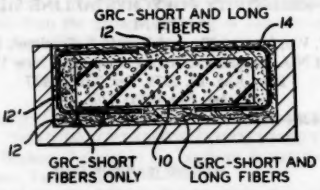
and the hook configuration of the respective arm, in order to permit an overlapping relationship of adjacent plates.

4,229,497

COMPOSITE MODULE WITH REINFORCED SHELL

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

Continuation-in-part of Ser. No. 754,877, Dec. 27, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,411
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.[2] **E04C** *1/40, 2/06*
U.S. Cl. 428—71 **25 Claims**



1. Composite panel-like building module comprising a rigid foam core encapsulated in a fiber-reinforced shell of cementitious material having edge portions and major surface portions:

(i) said major surface portions being reinforced with a first fibrous reinforcing material in discrete fiber form distributed in an interconnected random matrix in the major surface portions of the shell;

(ii) said edge portions being reinforced with two further fibrous reinforcing materials, one being in discrete fiber form which is premixed with the cementitious material forming the edge portions and the other being in scrim form which extends from the edge portions into the major surface portions of the shell, said premixed fibers being shorter than the first fibrous reinforcing material in the major surface portion of the shell.

15. Composite module such as a highway barrier comprising a rigid foam core encapsulated in a shell of reinforced cementitious material which is formed in situ around the core by

(a) providing a mold having a bottom and side walls;

(b) lining said mold with a scrim reinforcing materials

(c) suspending a rigid foam core member wrapped in a scrim reinforcing material in said mold leaving a free space between the wrapped core member and the mold bottom and side walls

(d) filling said free space with a premix of wet cementitious material and fibers; and

(e) curing said cementitious material and removing the thus formed module from the mold.

16. Process for making a composite panel-like building module having a rigid foam core encapsulated in a shell of reinforced cementitious material which comprises:

(a) providing a mold having a bottom and side walls;

(b) successively applying wet cementitious material and individual fibers in the mold, the fibers being applied by chopping rolls of continuous fibers and spraying the chopped fibers into the mold;

(c) distributing the fibers into the wet cementitious material in a random interconnected matrix to form a bottom layer;

(d) placing scrim reinforcing material on top of the bottom layer and which extends therefrom up over the top of the mold side walls;

(e) placing a rigid foam core member on said bottom layer, said core member having a peripheral shape smaller than the mold interior leaving a free space between the core member and the mold side walls, said core member having a thickness less than the height of the mold side walls;

(f) depositing wet cementitious material premixed with fibers in the free space between the core member and the mold side walls;

(g) folding the scrim material extending over the top of the mold side walls in over the core member;

(h) successively applying wet cementitious material and individual fibers in the mold, the fibers being applied by chopping rolls of continuous fibers and spraying the chopped fibers into the mold;

(i) distributing the fibers into the wet cementitious material applied in (h) in a random interconnected matrix to form a top layer over the core and folded scrim material to encase the core in an integral fiber reinforced shell of cementitious material; and

(j) curing the wet cementitious shell surrounding the core and removing the thus formed module from said mold.

25. Process for forming a composite module such as a highway barrier having a rigid foam core encapsulated in a shell of reinforced cementitious material which comprises

(a) providing a mold having a bottom and side walls;

(b) lining said mold with a scrim reinforcing material;

(c) suspending a rigid foam core member wrapped in a scrim reinforcing material in said mold leaving a free space between the wrapped core member and the mold bottom and side walls;

(d) filling said free space with a premix of wet cementitious material and fibers; and

(e) curing said cementitious material and removing the thus formed module from the mold.

4,229,498

LIGHT-POLARIZING FILM

Hajime Suzuki; Hiroyuki Hamada, and Rinjiro Ichikawa, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Mar. 29, 1979, Ser. No. 25,233
Int. Cl.[2] **B32B** *27/32;* **G02F** *1/17;* **G02B** *5/30*
U.S. Cl. 428—212 **14 Claims**

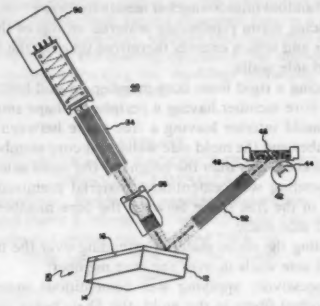
1. A light-polarizing film comprising a polymer mixture of (a) a polymer having polyene chains formed by partial dehydrohalogenation of a halogenated vinyl polymer or a halogenated vinylidene polymer and (b) at least one polymer selected from the group consisting of acrylate polymers and methacrylate polymers; said film having said polyene chains oriented by stretching at least 1.2 times its length and said film having substantially improved heat stability as compared to a similar film absent (b).

4,229,499

ACID PHTHALATE CRYSTAL

Ronald Jenkins, Peekskill, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,674
Int. Cl.[2] B32B *5/16, 9/00*
U.S. Cl. 428—336 15 Claims



6. An X-ray analyzing crystal exhibiting good deterioration resistant qualities, comprising:

(a) an acid phthalate crystal having a first surface and

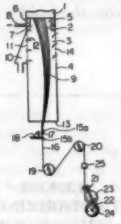
(b) a layer disposed at at least said first surface and having a thickness not exceeding about 2,000 A, said layer consisting essentially of a material selected from the group consisting of aluminum, gold, and carbon being substantially chemically inert to the ambient atmosphere.

4,229,500

POLYAMIDE MULTIFILAMENT YARN

Teruhiko Adachi, and Hitoshi Ikeda, both of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 3, 1978, Ser. No. 866,542
Claims priority, application Japan, Jan. 13, 1977, 52-1870
Int. Cl.[3] D02G *3/00*
U.S. Cl. 428—373 8 Claims



1. A polyamide yarn which comprises a plurality of multifilaments consisting essentially of polycapramide, characterized in that the individual filaments in said yarn have a birefringence (Δn) of from 0.045 to 0.055, a denier from 0.4 to 0.8 and an X-ray diffraction intensity ratio satisfying the following relationship (I):

$$0.50 \leqq I_{23}/I_{21} \leqq 1.00 \quad \text{(I)}$$

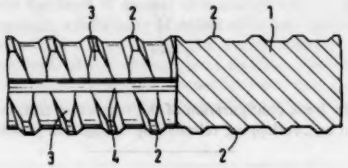
wherein I_{23} represents the X-ray diffraction intensity at a Bragg reflection angle (2θ) of 23.2 degrees and I_{21} represents the X-ray diffraction intensity at a peak formed at a Bragg reflection angle (2θ) of around 21 degrees.

4,229,501

STEEL RODS, ESPECIALLY REINFORCING OR TENSIONING RODS

Georg Kern, Munich, Fed. Rep. of Germany, assignor to Dyckerhoff & Widman Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 4, 1979, Ser. No. 36,139
Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821902
Int. Cl.[2] D02G *3/00;* E04C *3/30*
U.S. Cl. 428—399 5 Claims



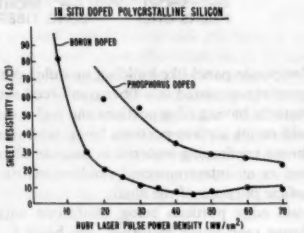
1. A steel rod of the type of a generally circular configuration comprising a core body, with at least two spaced longitudinal series or aligned ribs thereon extending beyond the core body which series together provide parts of a spiral winding of the core body, the improvement comprising at least one continuous longitudinal groove extending into the core body in a region between two of said series of spaced ribs.

4,229,502

LOW-RESISTIVITY POLYCRYSTALLINE SILICON FILM

Chung P. Wu, Mercerville, and Ronald K. Smeltzer, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 10, 1979, Ser. No. 65,437
Int. Cl.[3] B05D *3/06*
U.S. Cl. 428—446 11 Claims



1. In a method of fabricating a low-resistivity polycrystalline silicon film including the step of depositing said film on a substrate, the improvement in said method comprising the steps of:

doping said polycrystalline silicon film with boron in situ during said depositing step to a concentration greater than 1×10^{20} atoms/cm^3 and then

irradiating said film with a laser pulse.

4,229,503

COATING UNCURED CEMENTITIOUS ROOFING TILES

Henry Day, Sydney, Australia, assignor to Monier Limited, Chatswood, Australia

Filed Jul. 5, 1977, Ser. No. 812,969
Claims priority, application Australia, Jul. 5, 1976, PC6533; Oct. 20, 1976, PC7799
Int. Cl.[2] D06N *7/04;* B05D *3/02;* B32B *13/12*
U.S. Cl. 428—451 8 Claims

1. A method of coating an uncured cementitious roofing tile

comprising applying to said tile an aqueous emulsion of a filmforming polymeric material; wherein said emulsion contains at least one soluble soap, in addition to an emulsifier, in an amount from about 0.2 to about 10 parts per hundred parts by weight of polymer in the emulsion.

4,229,504

POLYOLEFIN COMPOSITION HAVING HIGH IMPACT RESISTANCE AND HIGH TEMPERATURE FLOW RESISTANCE

Armand E. Brachman, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 31, 1978, Ser. No. 929,611
Int. Cl.[2] B32B *27/20, 27/32*
U.S. Cl. 428—461 **21 Claims**

1. As a new composition of matter, a resin blend of polyolefin and an elastomer to which a filler is added characterized by having rigidity, a high level of impace resistance and high temperature flow resistance, consisting essentially of:

(a) about 30 to 90 weight percent of a resin containing

(i) greater than 50 to less than 75 weight percent of at least one polyolefin selected from the group consisting of isotactic crystalline polypropylene, high density crystalline polyethylene, low density polyethylene and propylene-ethylene copolymers in which propylene is present in 85–95% by weight and which has a tensile yield elongation no greater than 20%, and

(ii) greater than 25 to less than 50 weight percent of elastomer and

(b) about 10 to 70 weight percent of an inorganic filler selected from the group consisting of calcium carbonate, talc, clay, silica, quartz, mica, and barytes.

4,229,505

ACRYLATE-UREADIACETOACETAMIDE-DIACETOACETAMIDE COPOLYMERS

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 942,189, Sep. 14, 1978. This application Aug. 13, 1979, Ser. No. 65,856
Int. Cl.[2] B32B *27/34;* C08G *6/00, 12/28*
U.S. Cl. 428—474.4 **14 Claims**

1. A thermoplastic floor covering coated with a wear layer composition comprising a cross-linked random acrylate-ureadiacetoacetamide-diacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one ureadiacetoacetamide and at least one diacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate, the ureadiacetoacetamide, and the diacetoacetamide.

8. A thermoplastic floor covering coated with a wear layer composition comprising a cross-linked acrylate-ureadiacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one ureadiacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate and the ureadiacetoacetamide.

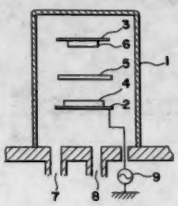
4,229,506

PIEZOELECTRIC CRYSTALLINE FILM OF ZINC OXIDE AND METHOD FOR MAKING SAME

Hiroshi Nishiyama, Mukou; Toshio Ogawa, and Tasuku Mashio, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 14, 1978, Ser. No. 942,351
Claims priority, application Japan, Sep. 17, 1977, 52/111761
Int. Cl.[3] H01L *41/18;* C23C *15/00;* B32B *9/00*
U.S. Cl. 428—539 **7 Claims**

1. A piezoelectric crystalline film disposed on a substrate, said film being a crystalline zinc oxide film with a hexagonal crystal structure and a c-axis substantially perpendicular to the



substrate surface, characterized in that said crystalline zinc oxide film contains 0.01 to 20.0 atomic percent of uranium.

4,229,507

METHOD FOR DRYING WOOD MATERIAL

Tamotsu Kai, Saitama, Japan; Michio Tsurumi, Midland, Mich.; Takashi Sakakiyama, Yokohama, and Kunihiro Horiuchi, Chiba, both of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,590
Claims priority, application Japan, Feb. 17, 1978, 53-16613; Feb. 17, 1978, 53-16614; Nov. 24, 1978, 53-144244
Int. Cl.[3] B27K *5/02*
U.S. Cl. 428—541 **22 Claims**

15. A wood material controlled in the rate of evaporation of water from the surface thereof, comprising an undried wood material having a water content of from 50 to 200 wt.% and a barrier layer provided on the surface of said wood material in an amount of 10 to 200 g (dry weight) per square meter of the surface area, said barrier layer being a continuous polymeric film having a water vapor permeability in the range from 10 to 100 g/m^2.day (as measured under the condition of the relative humidity of 90% at 37.8° C.).

4,229,508

RESTORATION OF NICKEL-CADMIUM BATTERIES

George K. Mussler, 11 Beech Ct., Malverne, N.Y. 11565

Filed Dec. 12, 1979, Ser. No. 102,680
Int. Cl.[3] H01M *6/50*
U.S. Cl. 429—49 **4 Claims**

1. A process for the restoration of rechargeable nickel-cadmium batteries comprising:

providing a reasonable clean expended nickel-cadmium battery;

submersing said battery in boiling water and maintaining same in the boiling water for a period of time within the approximate range of from 15 to 20 minutes;

removing the heated battery from the boiling water and immediately cooling same to approximately room temperature and then electrically recharging the cooled battery.

4,229,509

NON-AQUEOUS PRIMARY BATTERY HAVING A BISMUTH (III) SULFIDE CATHODE

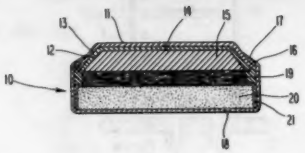
Nehemiah Margalit, Levittown, Pa., assignor to ESB Technology Company, Yardley, Pa.

Filed Apr. 9, 1979, Ser. No. 28,402
Int. Cl.[2] H01M *4/06*
U.S. Cl. 429—194 **6 Claims**

1. A non-aqueous primary battery having

(a) a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium;

(b) an electrolytic solution comprised of an organic solvent and a light inorganic salt dissolved therein;
(c) a separator; and



(d) a cathode consisting of bismuth (III) sulfide without binder or conductors added.

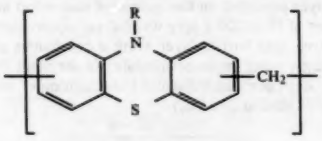
4,229,510

PHOTOCONDUCTIVE POLYMER MATERIAL OF N-ALKYLPHENOTHIAZINE AND FORMALDEHYDE

Syu Watarai; Kenichi Sawada, and Takeshi Saida, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 26, 1979, Ser. No. 33,630
Claims priority, application Japan, Apr. 26, 1978, 53/49459
Int. Cl.[2] G03G *5/07*
U.S. Cl. 430—38 **2 Claims**

1. An electrophotographic element comprising a substrate having thereon a conductive surface and a layer of a polymer having a repeating unit of the formula:



wherein R represents an alkyl group having from 1–14 carbon atoms.

4,229,511

ELECTROPHOTOGRAPHY WITH UNIFORM EXPOSURE FOR RESIDUAL POTENTIAL

Tatuya Katoh, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 17, 1978, Ser. No. 952,158
Claims priority, application Japan, Oct. 22, 1977, 52/126944
Int. Cl.[3] G03G *13/22, 5/14*
U.S. Cl. 430—55 **5 Claims**

1. An electrophotographic copying process, using an electrophotographic element consisting essentially of a light-transmitting electroconductive support, a charge carrier generating layer on said support and a charge carrier transport layer on said charge carrier generating layer, which process consists essentially of the steps of: applying a uniform electrostatic charge of one polarity to said electrophotographic element; then imagewise exposing said electrophotographic element by applying a light image onto one outer surface of said electrophotographic element to form an electrostatic latent image on said electrophotographic element; simultaneously with or after said imagewise exposing step, uniformly exposing said electrophotographic element by applying light onto the entirety of the opposite outer surface of said electrophotographic plate to substantially eliminate the residual potential in said electrophotographic element, the amount of exposure, measured as lux.-sec, applied in said step of uniformly exposing being from 1/20 to ½ the amount of exposure, measured as lux.sec, applied in said step of imagewise exposing; after said step of uniformly exposing, then developing said latent image and transferring the developed image to another substrate.

4,229,512

TONERS FOR COLOR FLASH FUSERS CONTAINING A PERMANENT COLORANT AND A HEAT SENSITIVE DYE

Myron J. Lenhard, Penfield; James D. Rees, Pittsford, both of N.Y., and Xerox Corporation, 02, Stamford, Conn.

Division of Ser. No. 754,807, Dec. 27, 1976, Pat. No. 4,126,565.
This application Oct. 6, 1978, Ser. No. 949,165
Int. Cl.[2] G03C *9/08*
U.S. Cl. 430—106 **5 Claims**

1. Electrostatographic toner particles for utilization in flash fusing systems, such particles being comprised of resins, permanent colorant, and heat sensitive and light sensitive dye, wherein the dyes upon heating, and upon exposure to light decomposes to form substantially colorless products.

4,229,513

LIQUID ELECTROGRAPHIC DEVELOPERS CONTAINING POLYMERIC QUATERNARY SALTS

Stewart H. Merrill, Rochester; Alec N. Mutz, Kodak Park, and Frederick A. Stahly, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 824,132, Aug. 12, 1977, abandoned. This application May 29, 1979, Ser. No. 43,860
Int. Cl.[2] G03G *9/12*
U.S. Cl. 430—115 **11 Claims**

1. A negatively charged electrographic developer comprising an electrically insulating carrier liquid having stably dispersed therein (1) a halogenated polymer, and having dissolved therein (2) a copolymer of a quaternary ammonium salt monomer and a solubilizing monomer, said copolymer being free of cations of alkali metals and alkaline earth metals, and (3) a copolymer of a polar monomer and a solubilizing monomer, the amounts of solubilizing monomer units in each copolymer being sufficient to make the copolymer soluble in the carrier liquid.

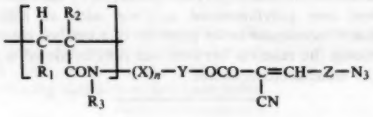
4,229,514

PHOTOSENSITIVE COMPOSITION

Yoshio Kurita, Hino, and Akio Iwaki, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo

Continuation of Ser. No. 818,728, Jul. 25, 1977, abandoned. This application Dec. 29, 1978, Ser. No. 974,431
Int. Cl.[3] G03C *1/52, 1/68*
U.S. Cl. 430—195 **13 Claims**

1. A photosensitive composition containing as active ingredient a polymer which has, in the molecular structure, a structural unit represented by the general formula (I):



wherein R_1 represents hydrogen, an alkyl group or carboxyl; R_2 represents hydrogen, halogen or an alkyl group; R_3 represents hydrogen, an alkyl group, an aryl group or an aralkyl group; Y and Z individually represent an arylene group; X represents a divalent organic group connecting the adjacent nitrogen atom and the aromatic ring carbon atom of Y; and n represents 0 or 1, the structural unit of said polymer being present in said polymer in an amount not less than 10 mole percent and said polymer having a molecular weight of from about 2,000 to about 1,000,000.

4,229,515

POLYMERS FOR USE IN DYE IMAGE-RECEIVING LAYERS OF IMAGE TRANSFER FILM UNITS

Karel L. Petrak, North Harrow, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,213

Int. Cl.[2] G03C 5/54, 1/40, 1/76; C08S 5/20

U.S. Cl. 430—213 34 Claims

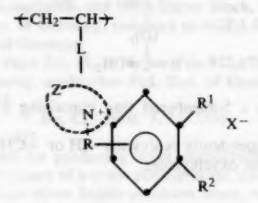
18. In an image transfer film unit comprising:

(1) a support having thereon at least one layer containing a photosensitive silver halide emulsion having associated therewith a chelating dye or chelating dye-forming material;

(2) a dye image-receiving layer; and

(3) an alkaline processing composition and means for discharging same within said film unit in contact with said photosensitive layer;

said film unit containing a silver halide developing agent, the improvement wherein the dye image-receiving layer contains a water-soluble polymer comprising a recurring unit of the formula:



wherein:

L is selected from the group consisting of a single bond and a bivalent linking group;

Z represents the atoms necessary to complete a heterocyclic nucleus;

R is selected from the group consisting of a single bond and alkylene;

R^1 and R^2 are independently chelating groups; and

X^- is an anion,

said polymer having associated therewith a source of metal ions.

4,229,516

PHOTOGRAPHIC MATERIAL WITH TEMPORARY BARRIER LAYER COMPRISING A MIXTURE OF VINYLIDENE CHLORIDE TERPOLYMER AND POLYMERIC CARBOXY-ESTER-LACTONE AND PHOTOGRAPHIC TRANSFER PROCESS THEREFOR

Edward P. Abel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1978, Ser. No. 948,062

Int. Cl.[2] G03C 1/40, 5/54, 7/00

U.S. Cl. 430—215 29 Claims

1. In a photographic element comprising a support, at least one silver halide emulsion layer, a dye image-providing layer, a dye image-receiving layer and a neutralizing layer, said element containing a single temporary barrier layer coated from an organic solvent coating solution, said barrier layer having an activation energy of penetration by an aqueous alkaline solution of greater than 18 kcal/mole and being between said neutralizing layer and said silver halide emulsion layer, said neutralizing layer providing a pH of 11 or less to the silver halide emulsion layer upon breakdown of said barrier layer, the improvement wherein said barrier layer comprises a mixture of (1) from 5 to 95 percent by weight of a copolymer comprising from 55 to 85 percent by weight of vinylidene chloride, 5 to 35 percent by weight of an ethylenically unsaturated monomer, which is different from the other monomers of the copolymer, 0 to 20 percent by weight of a ethylenically unsaturated carboxylic acid, and (2) from 5 to 95 percent by weight of a polymeric carboxy-ester-lactone.

6. In a photographic film unit comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing layer;

(b) a dye image-receiving layer;

(c) alkaline processing composition and means for discharging same within said film unit in contact with said photosensitive layer;

(d) a neutralizing layer for neutralizing said alkaline processing composition; and

(e) a single barrier layer coated from an organic solvent coating solution, said barrier layer having an activation energy of penetration by an aqueous alkaline solution of greater than 18 kcal/mole and being which is permeable by said alkaline processing composition after a predetermined time located between said neutralizing layer and said photosensitive silver halide emulsion,

said film unit containing a silver halide developing agent, said neutralizing layer providing a pH of 11 or less to the silver halide emulsion layer upon breakdown of said barrier layer, the improvement wherein said barrier layer comprises a mixture of (1) from 5 to 95 percent by weight of a copolymer comprising from 55 to 85 percent by weight of vinylidene chloride, 5 to 35 percent by weight of an ethylenically unsaturated monomer, which is different from the other monomers of the copolymer, 0 to 20 percent by weight of an ethylenically unsaturated carboxylic acid, and (2) from 5 to 95 percent by weight of a polymeric carboxy-ester-lactone.

26. In a process of producing a photographic transfer image in a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, a receiving layer, a single barrier layer coated from an organic solvent coating solution, said barrier layer having an activation energy of penetration by an aqueous alkaline solution of greater than 18 kcal/mole and being associated with the neutralizing layer being permeable by said alkaline processing composition after a predetermined time, and which is located between said photosensitive silver halide emulsion layer and said neutralizing layer, said neutralizing layer providing a pH of 11 or less to the silver halide emulsion layer upon breakdown of said barrier layer, said process comprising:

(a) imagewise exposing said photographic element;

(b) treating said element with alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers;

(i) an imagewise distribution of dye image-providing material being formed as a function of development; and

(ii) at least a portion of said imagewise distribution of said dye image-providing material diffusing to said dye image-receiving layer; and

(c) neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element after said predetermined time;

the improvement wherein said barrier layer comprises a mixture of (1) from 5 to 95 percent by weight of a copolymer comprising 55 to 85 percent by weight of vinylidene chloride, from 5 to 35 percent by weight of an ethylenically unsaturated monomer, which is different from the other monomers of the copolymer, and 0 to 20 percent by weight of an ethylenically unsaturated carboxylic acid, and (2) from 5 to 95 percent by weight of a polymeric carboxy-ester-lactone.

4,229,517
DOT-ETCHABLE PHOTOPOLYMERIZABLE ELEMENTS

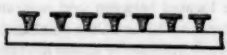
Martin D. Bratt, Parsippany, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 802,512, Jun. 1, 1977, abandoned, which is a division of Ser. No. 741,039, Nov. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,726, Nov. 17, 1975, abandoned. This application May 10, 1979, Ser. No. 37,947

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651864; Australia, Nov. 16, 1976, 019666/76; Belgium, Nov. 17, 1976, 172416; Brazil, Nov. 17, 1976, PI 7607672; Canada, Nov. 17, 1976, 265899; France, Nov. 17, 1976, 76 034572; Japan, Nov. 17, 1976, 76/139041; United Kingdom, Nov. 17, 1976, 047954/76; Fed. Rep. of Germany, Feb. 17, 1978, 2660103

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—271 **25 Claims**



1. A high contrast, dot-etchable solvent-processable lithographic film element comprising a support bearing a very thin actinic radiation photopolymerizable layer no more than 0.010 mm thick and having an optical density of at least 3.0 to the actinic radiation, the photopolymerizable layer comprised of an ethylenically unsaturated compound capable of forming a high polymer by free radical initiated, chain propagating, addition polymerization, an organic polymeric binder, a free radical generating addition polymerization initiator system activatable by actinic radiation in the spectral region of 300 nm or above, and optionally containing an actinic radiation absorber, the photopolymerizable layer being the outermost layer of the element or being contiguous to a removable cover sheet or an overcoat layer which is at least partially soluble in or permeable to a developer solvent for the photopolymerizable layer.

4,229,518
PHOTOHARDENABLE ELEMENTS WITH A NON-TACKY MATTE FINISH

Russell H. Gray, Rumson, N.J., and August D. Kuchta, Sayre, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 342,262, Mar. 16, 1973, abandoned. This application Jul. 8, 1976, Ser. No. 703,537

Int. Cl.² G03C *1/78*

U.S. Cl. 430—273 **4 Claims**

1. A photosensitive element comprising, in order, (1) a sheet support, (2) at least one toned, image-bearing photohardenable layer, and (3) a photohardenable protective layer having on its surface a non-tacky matte finish comprising a particulate oil-absorbing material selected from the group consisting of diatomaceous silicas and cellulose acetates having an average particle size of 1 to 25 microns, which absorbs at least 100% by weight of oil based on the weight of particulate material in the photohardenable protective layer as determined by the Gardner-Coleman Method, A.S.T.M. D-1483-60 and which does not absorb incident light to a degree that the color or appearance of the image-bearing layer contiguous thereto is changed from the normal, said photohardenable layers being comprised of a material selected from photopolymerizable, photocrosslinkable, and photodimerizable materials.

4,229,519
PHOTO-POLYMERIZABLE WATER-DEVELOPABLE COMPOSITION AND ELEMENTS

Gerald B. Sharp, Harrow; Karel L. Petrak, North Harrow; John H. Boielle, Tring; Hans M. Wagner, Stanmore, and John F. Langford, Berkhamsted, all of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1979, Ser. No. 44,273

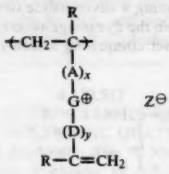
Claims priority, application United Kingdom, May 31, 1978, 25437/78

Int. Cl.² G03C *1/68, 5/00*

U.S. Cl. 430—287 **10 Claims**

1. A water-developable, radiation-sensitive composition comprising

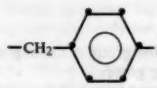
(a) a polymer containing a recurring unit with the structure



wherein G is a 5-membered ring containing a quaternized nitrogen;

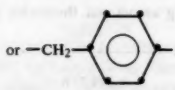
each R independently represents —H or —CH_3;

A is alkylene; oxyalkylene;



—$COO(CH_2)_6OOCCH_2$—; or —$CONH(CH_2)_6HNOCCH_2$—;

D is alkylene; oxyalkylene; —$CH_2COOCH_2CH_2OOC$—; —$CH_2CONH(CH_2)_6HNOC$—; —$(CH_2)_6OOC$—;



a represents 1, 2 or 3;

b represents 2 or 3;

x represents 0 or 1;

y represents 0 or 1; and

$Z^{\ominus}$ is an anion; and

(b) a photoinitiator comprising a trihalomethane derivative and a metal carbonyl compound or a metallocene.

4,229,520
PHOTO-POLYMERIZATION AND DEVELOPMENT PROCESS WHICH PRODUCES DOT-ETCHABLE MATERIAL

Martin D. Bratt, Old Bridge, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 741,039, Nov. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,726, Nov. 17, 1975, abandoned. This application Jun. 18, 1979, Ser. No. 49,314

Int. Cl.² G03C *5/00, 1/68*

U.S. Cl. 430—322 **16 Claims**

1. A process of image reproduction which comprises imagewise exposing to actinic radiation a photopolymerizable element which comprises a support bearing a photopolymerizable layer containing actinic radiation absorbing material and hav-

ing a maximum thickness of 0.015 mm and an optical density in the actinic region of at least 3.0, said photopolymerizable layer being the outermost layer of the element or being contiguous to a removable cover sheet or an overcoat layer which is at least partially soluble in or permeable to a solvent for the photopolymerizable layer, said exposure being through the

outermost surface of the photopolymerizable layer or removable cover sheet or overcoat layer, when present, and wherein said exposure produces image areas having a hardened upper skin which rests on a softer undervolume having a lesser degree of polymerization or hardening, and then developing by removing the unexposed areas of the layer to form an image.

4,229,521

METHOD OF PROCESSING PHOTOGRAPHIC MATERIALS

Karl Frank, Leverkusen, and Hans-Dieter Block, Cologne, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,675

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732153

Int. Cl.[2] G03C *5/32, 7/00*

U.S. Cl. 430—372 **6 Claims**

1. A process for producing color photographic images by imagewise exposure of a color photographic material containing at least one silver halide emulsion layer, color development, bleaching, after-treatment with an acid compound capable of discoloration prevention, in a bath and fixing,

wherein the improvement comprises the photographic material is first treated with a bleaching bath containing an iron III salt and then is treated with a bath which contains an effective amount of an acid discoloration preventative compound corresponding to the following general formula:

$$A—PO_3H_2$$

wherein A denotes hydroxyl or an alkyl group having from 1 to 6 C atoms which is substituted with at least one carboxyl group.

4,229,522

METHOD FOR FORMING COLOR IMAGES

Shigeru Nakamura; Isao Shimamura; Taku Nakamura; Shinji Sakaguchi; Takushi Miyazako; Masatoshi Sugiysma, and Akio Mitsui, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

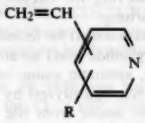
Continuation-in-part of Ser. No. 954,950, Oct. 26, 1978, abandoned. This application Apr. 13, 1979, Ser. No. 30,045

Claims priority, application Japan, Oct. 26, 1977, 52-128389

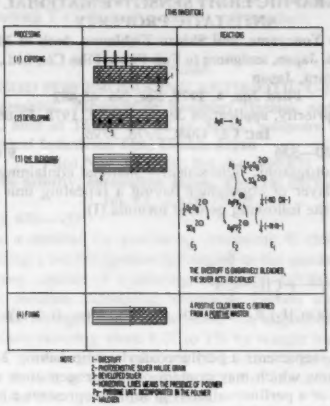
Int. Cl.[2] G03C *7/00*

U.S. Cl. 430—390 **16 Claims**

1. A method for forming color images which comprises exposing a color photographic light-sensitive element containing a dye, a polymer containing at least 30 mol% of a vinylpyridine represented by the formula:



wherein R is a hydrogen atom or an alkyl group and silver halide, forming developed silver imagewise by development processing and then processing with an aqueous solution containing peroxoic acids or salt thereof to thereby oxidatively bleach said dye.



4,229,523

METHOD OF UNDERCOATING TREATMENT OF POLYESTER FILMS FOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Hideyasu Ohta; Jun Shirasaki; Masaru Kanbe; Naoto Abe; Takahiro Uozumi, and Masayoshi Mayama, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 832,725, Sep. 12, 1977, abandoned, which is a continuation of Ser. No. 608,273, Aug. 27, 1975, abandoned. This application Mar. 30, 1979, Ser. No. 25,395

Claims priority, application Japan, Aug. 31, 1974, 49-100445

The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.

Int. Cl.[3] G03C *1/78*

U.S. Cl. 430—532 **7 Claims**

1. A method of coating a polyester film of a light-sensitive photographic material comprising

(a) treating a side of said film by the method selected from the group consisting of corona discharge, ultraviolet irradiation, or flame treatment whereby the contact angle between said side and water is below 58°,

(b) applying to said treated side a layer of an aqueous dispersion containing no organic solvent acting as a solvent or swelling agent, said dispersion containing a copolymer having, as repeating units, 20 to 60% by weight of glycidyl methacrylate and 25 to 60% by weight of ethylacrylate, the sum of said glycidyl methacrylate and said ethyl methacrylate, being at least 76% by weight based on the weight of said copolymer whereby a coated side is formed, and

(c) subjecting said coated side to a temperature of between 60° C. and 150° C. whereby said coated side is dried and said layer has a weight of 0.05 to 5.0 g/m^2, and

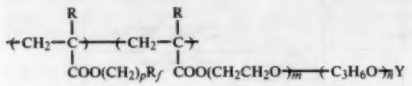
(d) applying to said dried coated side a silver halide emulsion layer.

4,229,524
PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL WITH ANTISTATIC PROPERTY

Masakazu Yoneyama, and Shinzo Kishimoto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 4, 1979, Ser. No. 45,482
Claims priority, application Japan, Jun. 2, 1978, 53-66516
Int. Cl.[2] G03C *1/78, 1/96*
U.S. Cl. 430—536 **9 Claims**

1. A photographic light-sensitive material containing, in at least one layer of copolymer having a repeating unit represented by the following general formula (I):



(I)

wherein R_f represents a perfluoroalkyl group having 2 to 12 carbon atoms which may contain one hydrogen atom at the ω-position or a perfluoroalkenyl group; R represents a hydrogen atom or a methyl group; p represents an integer of 1 to 5; m represents an integer of 5 to 50; n represents 0 or an integer of 1 to 20; and Y represents a hydrogen atom, an alkyl group having 1 to 24 carbon atoms, an alkenyl group, a phenyl group, an alkylphenyl group or one of the groups represented by R_f.

4,229,525
PROCESS FOR IMPROVING IMAGE-SHARPNESS OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Hirozo Ueda, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 589,995, Jun. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 346,387, Mar. 30, 1973, abandoned, which is a continuation of Ser. No. 118,488, Feb. 24, 1971, abandoned. This application Nov. 29, 1976, Ser. No. 745,893
Claims priority, application Japan, Feb. 24, 1970, 45/15705
Int. Cl.[3] G03C *1/02*
U.S. Cl. 430—568 **4 Claims**

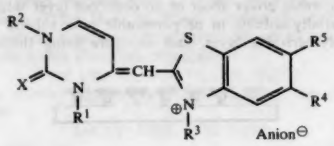
1. A process for improving image-sharpness of a photosensitive material comprising a support having thereon at least one layer containing a negative working photographic emulsion containing randomly dispersed light-sensitive silver halide grains having an average grain size of from 0.3 to 3.0 microns in diameter, as the main silver halide image-yielding component thereof in a photographically compatible dispersing medium, which process comprises incorporating at random in said emulsion prior to adding any sensitizing dye to said emulsion super-fine grains of silver halide having an average grain size of less than 0.2 microns in diameter in said emulsion in an amount of from 10 g to 50 g per 100 g of said dispersing medium, said super-fine grains of silver halide co-existing with said light-sensitive silver halide grains and being substantially transparent to visible rays and contributing very little to the formation of an image directly, whereby said emulsion exhibits increased image sharpness without a significant decrease in speed and/or gradation.

4,229,526
LIGHT-SENSITIVE PHOTOGRAPHIC RECORDING MATERIAL

Hans Öhlschläger, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,737
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833137
Int. Cl.[2] G03C *1/16*
U.S. Cl. 430—583 **2 Claims**

1. Light-sensitive photographic recording material comprising at least one negative silver halide emulsion layer which is spectrally sensitized with a monomethine cyanine dye of the following formula



in which

R^1 and R^2 which may be the same or different represent each a saturated or unsaturated aliphatic hydrocarbon group;

R^3 represents a saturated or unsaturated, substituted or unsubstituted hydrocarbon group;

R^4 and R^5 which may be the same or different represent hydrogen or saturated or unsaturated hydrocarbon groups, alkoxy groups or halogen;

X represents **O** or S and

Anion ⊖ represents any photographically inert anion, and is absent when R^3 contains an acid group in the anionic form so that a betaine is present.

4,229,527
PROCESS AND REAGENT FOR THE KINETIC DETERMINATION OF ENZYME SUBSTRATES

Joachim Ziegenhorn, Unterpfaffenhofen; August W. Wahlefeld, Weilheim; Alexander Hagen, Tutzing; Wolfgang Grüber, Tutzing-Unterzeismering, and Hans U. Bergmeyer, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 751,777, Dec. 16, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 954,139
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558536
Int. Cl.[2] C12Q *1/50, 1/54, 1/48, 1/44*
U.S. Cl. 435—11 **5 Claims**

1. Process for the kinetic determination of an enzyme substrate which process comprises subjecting the substrate to at least two enzymatic part reactions in a sequence of reactions to yield an indicating substance, selecting the part reaction which exhibits the greatest specificity with regard to the starting substance of the reaction, overdosing the enzyme or enzymes of the other part reaction or reactions by an amount at least twice as large as the amount normally necessary for the reaction so that said most specific part reaction becomes rate-determining and follows first or pseudo first order kinetics, and measuring a change in the indicating substance during a preselected time interval.

4,229,528
FLUORESCENCE METHOD FOR ENZYME ANALYSIS WHICH COUPLES AROMATIC AMINES WITH AROMATIC ALDEHYDES

Robert E. Smith, 557 Escondido Cir., and Frank A. Dolbeare, 5178 Diane La., both of Livermore, Calif. 94550

Division of Ser. No. 828,394, Aug. 29, 1977, Pat. No. 4,155,916. This application Nov. 13, 1978, Ser. No. 959,555
Int. Cl.[2] G01N *31/14*
U.S. Cl. 435—23 **5 Claims**

1. A method of assaying for enzymes that hydrolyse an arylamide bond comprising:

(a) adding to an unknown to be tested for an enzyme that hydrolyzes an arylamide bond an amino acid-containing, water dispersible, aromatic amine substrate which is selected so that when hydrolyzed by the enzyme, it produces an aromatic amine from the group consisting of 4-methoxy-2-naphthylamine, 2-naphthylamine, aminoisophthalic acid dimethyl ester, p-nitroaniline, 4-methoxy-1-aminofluorene and 7-amino-4-methylcoumarin;

(b) incubating the mixture for a time sufficient to allow reaction of the enzyme with the substrate;
(c) adding to the unknown, either before or after incubating, a water dispersible aromatic aldehyde, selected from the group consisting of benzaldehyde, p-nitrobenzaldehyde and 5-nitrosalicylaldehyde, suitable for coupling to the hydrolyzed aromatic amine to produce a fluorescent complex with the aromatic amine;
(d) exposing the aldehyde-containing, incubated mixture to ultraviolet light; and
(e) sensing the fluorescence of said exposed mixture for a time sufficient.

4,229,529

PROCESS FOR DETERMINING FORMATE AND REAGENT THEREFOR

Gerhard Michal, Tutzing; Rolf Laube, Weilheim; Albert Röder, Seeshaupt, and Walter Schneider, Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,823

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2712004

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—26 **14 Claims**

1. Process for the determination of a formate compound selected from formate, or a compound convertible into formate, which process comprises reacting said formate compound in the presence of formate dehydrogenase from *Candida boidinii* DSM 941 and a hydrogen acceptor, and then measuring the NADH formed as a measure of the formate compound initially present.

4,229,530

METHODS AND MEDIA FOR RAPID DETECTION OF PATHOGENIC NEISSERIA

Richard A. Finkelstein, Dallas, Tex., and Shelley M. Payne, Albany, Calif., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Aug. 29, 1978, Ser. No. 937,881

Int. Cl.[3] C12Q *1/12*

U.S. Cl. 435—37 **12 Claims**

1. A medium for enhancing the growth and rapid detection of pathogenic Neisseria, which includes at least about 5 micrograms of iron in the form of an iron-dextran complex.

4,229,531

PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

William R. Tolbert, Manchester; Joseph Feder, University City, and Mau-Jung Kuo, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1978, Ser. No. 974,404

Int. Cl.[2] C12P *1/00*

U.S. Cl. 435—41 **7 Claims**

1. Process for the production of human TAF in vitro comprising growing the human colon adenocarcinoma cell line HT-29 in agitated, liquid suspension of nutrient culture medium at about 35°–38° C. for a sufficient time to elaborate TAF and isolating the resulting TAF from the cells or cell product.

4,229,532

PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

William R. Tolbert, Manchester, and Joseph Feder, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1978, Ser. No. 974,406

Int. Cl.[2] C12P *1/00*

U.S. Cl. 435—41 **6 Claims**

1. Process for the production of human TAF in vitro comprising growing the human osteosarcoma cell line MG-63 in agitated, liquid suspension of nutrient culture medium at about 35°–38° C. for a sufficient time to elaborate TAF and isolating the resulting TAF from the cells or cell product.

4,229,533

METHOD FOR PRODUCING ANTIBIOTIC C-15003 P-4

Eiji Higashide, Takarazuka; Kazunori Hatano, and Mitsuko Asai, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 13, 1978, Ser. No. 959,471

Claims priority, application Japan, Nov. 18, 1977, 52-139384

Int. Cl.[3] C12P *17/18*

U.S. Cl. 435—119 **3 Claims**

1. In a method for producing Antibiotic C-15003 P-4 by cultivating a microorganism belonging to the genus Nocardia and being capable of producing Antibiotic C-15003 P-4 in a culture medium containing assimiable carbon sources and digestible nitrogen sources, wherein the improvement comprises incorporating about 0.01 to 1% by weight based on the volume of the culture medium of leucine, α-ketoisocaproic acid or its salt, or an ester, amide or salt of leucine as additive substances into the culture medium.

4,229,534

ACETYLTHIENAMYCIN PRODUCTION

Jean S. Kahan; Frederick M. Kahan, both of Rahway; Robert T. Goegelman, Linden; Edward O. Stapley, Metuchen, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 827,503, Aug. 25, 1977, Pat. No. 4,165,379, which is a continuation of Ser. No. 634,301, Nov. 21, 1975, abandoned. This application Apr. 5, 1979, Ser. No. 27,531

Int. Cl.[2] C12P *17/18*

U.S. Cl. 435—119 **2 Claims**

1. A process for the production of N-acetyl thienamycin which comprises cultivating *Streptomyces cattleya* in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic conditions and recovering the N-acetyl thienamycin so produced.

4,229,535

METHOD FOR PREPARING MULTHIOMYCIN

Eisuke Ishihara, Miyanonishi; Hiroshi Yonehara, Tokyo; Katsuyuki Akasaki, Shimizu; Masao Minowa, and Katsumi Kobayashi, both of Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 681,198, Apr. 28, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,917

Claims priority, application Japan, Oct. 28, 1975, 50-128910

Int. Cl.[3] C12P *13/00*

U.S. Cl. 435—128 **5 Claims**

1. The method for preparing multhiomycin which comprises cultivating a multhiomycin producing strain belonging to the genus Streptomyces in a sulfur-containing carboxylic acid-containing liquid culture medium, said acid being selected from the group consisting of cystine and methionine which is present in an amount of 0.01–5 weight percent and isolating said multhiomycin.

4,229,536

PROCESS FOR PREPARING IMMOBILIZED ENZYMES

Louis J. DeFilippi, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1978, Ser. No. 974,198

Int. Cl.[3] C12N *11/14, 11/08, 11/06*

U.S. Cl. 435—176 **15 Claims**

1. A process for increasing the activity and stability of an immobilized enzyme which comprises the steps of:
(a) treating an inorganic porous support material which possesses pore diameters of from about 100 to about

55,000 Angstroms and a surface area of from about 1 to about 500 m^2/g with a solution of a first water soluble bifunctional monomer;
(b) removing unadsorbed monomer;
(c) contacting the treated support material with a solution containing an excess of a second bifunctional monomeric material of from about 2 to about 50 moles of said bifunctional monomer per mole of said first water soluble bifunctional monomer wherein said second bifunctional monomeric material reacts with said first bifunctional monomer adsorbed on said support material to form a polymeric material and to provide pendent terminally functionalized groups for convalent bonding thereto of an enzyme;
(d) removing unreacted bifunctional monomeric material;
(e) treating the resultant inorganic-organic support matrix with an enzyme to covalently bind said enzyme to said support matrix;
(f) treating the resultant immobilized enzyme-support matrix complex with an additional amount of said second bifunctional monomeric material to provide pendent terminally functionalized groups for covalent bonding thereto of additional enzymes;
(g) removing excess bifunctional monomeric material;
(h) adding a substrate for said enzyme to the complex;
(i) treating said complex with an additional amount of said enzyme at a temperature in the range of from about 0° to about 20° C.;
(j) removing excess substrate and enzyme; and,
(k) treating said complex with a mixture of said substrate and bifunctional monomeric material.

4,229,537

PREPARATION OF TRICHLORO-S-TRIAZINE ACTIVATED SUPPORTS FOR COUPLING LIGANDS

Leonard T. Hodgins, New York, N.Y.; Thomas H. Finlay, Ridgewood, N.J., and Alan J. Johnson, New York, N.Y., assignors to New York University, New York, N.Y.

Filed Feb. 9, 1978, Ser. No. 876,240
Int. Cl.[2] C07G 7/00, 7/02
U.S. Cl. 435—177 **16 Claims**

1. In a method for coupling substances selected from the group consisting of protein ligands and non-protein affinity ligands by covalent chemical bonds to insoluble solid supports for the preparation of solid phase catalysts and biospecific adsorbents comprising the steps of reacting the insoluble solid support material with trichloro-s-triazine to produce an activated support and thereafter, coupling the ligand to the activated support, the improvement wherein the production of the activated support is carried out by the steps comprising:
(a) reacting a water-free insoluble solid support material with trichloro-s-triazine in a non-aqueous medium comprising an organic solvent which is compatible with the support material and is also a solvent for trichloro-s-triazine;
(b) neutralizing the HCl generated during the reaction with a tertiary amine which is soluble in said organic solvent and which does not form an insoluble complex with trichloro-s-triazine in said organic solvent; and
(c) washing the obtained dichloro-s-triazine activated support with an additional amount of said organic solvent.

4,229,538

PROCESS FOR PREPARING ACYL-COA SYNTHETASE LCF-18

Hideaki Yamada; Sakayu Shimizu, and Yoshiki Tani, all of Kyoto, Japan, assignors to Amano Pharmaceutical Co. Ltd., Nagoya, Japan

Filed Apr. 9, 1979, Ser. No. 28,604
Claims priority, application Japan, May 15, 1978, 53-56604; Jan. 26, 1979, 54-7244
Int. Cl.[3] C12N 9/10
U.S. Cl. 435—193 **2 Claims**

1. A process for preparing acyl-CoA synthetase LCF-18 comprising cultivating an acyl-CoA synthetase LCF-18 producing strain selected from the group consisting of Genera Gloeophyllum, Trametes, Daedalea, Laetiporus, Flammulina, Lentinus, Lenzites, Pycnoporus, Tyromyces, Coriolus and Schyzophyllum, and then isolating the enzyme of acyl-CoA synthetase LCF-18 from the thus cultured cells.

4,229,539

β-GALACTOSIDASE AND PRODUCTION THEREOF

Tan Miwa; Reisuke Kobayashi, both of Shizuoka, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1979, Ser. No. 6,575
Claims priority, application Japan, Feb. 6, 1978, 53/12102
Int. Cl.[2] C12N 9/38
U.S. Cl. 435—207 **7 Claims**

1. A powdery β-galactosidase isolated from the culture medium of *Penicillium multicolor* and having the following characteristics:
a. having a relative β-galactosidase activity of 224% for o-nitrophenyl-β-D-galactopyranoside and of 186% for p-nitrophenyl-β-D-galactopyranoside when assumed that the relative β-galactosidase activity is 100% for lactose;
b. having a molecular weight of about 120,000 as determined according to the gel-filtration method;
c. being active at pH of 2.5 to 7, the optimum pH being at 4.5;
d. said β-galactosidase activity being lost by heating at pH 6 and at 75° C. for 15 minutes, the optimum temperature being at 55° C.;
e. said β-galactosidase activity being stable in a pH range of 2.5 to 8.0 when standing at 4° C. for 24 hours;
f. said β-galactosidase activity being stable at 100% at 60° C. and reduced to 60% at 65° C., to 25% at 70° C. and to 0% at 75° C. when standing at pH 6 for 15 minutes;
g. said β-galactosidase activity being inhibited by about 20% by the presence of mercuric ion (Hg^{++}) but being not substantially inhibited by the presence of ferrous ion (Fe^{++}) and cupric ion (Cu^{++}) at a metal ion concentration of 10^{-3}M; and
h. having an iso-electric point of 5.37 when measured according to an electrophoresis method.

4,229,540

HYDROLASE PURIFIED FROM HUMAN PLASMA

Michael H. Coan, El Cerrito, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Jul. 2, 1979, Ser. No. 54,127
Int. Cl.[3] C12N 9/48, 9/50, 9/14
U.S. Cl. 435—219 **3 Claims**

1. An enzyme preparation comprising a substantially homogeneous hydrolytic enzyme characterized by being obtainable from human plasma, having a molecular weight of about 70,000 daltons as determined by comparative polyacrylamide gel electrophoresis, having a K_m for the substrate H-D-Phe-Pip-Arg-PNA of about 0.057 mM, having a K_I for benzamidine of about 1.1×10^{-5} M, being bindable to and elutable from insoluble barium salts, and, in vitro, capable of activating and degrading human Factor VIII, activating human Factor V, and inhibiting platelet aggregation induced by epinephrine, ADP, or collagen.

4,229,541

IN VITRO CULTIVATION OF HORSESHOE CRAB AMEBOCYTES

Frederick C. Pearson, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 6, 1978, Ser. No. 949,009
Int. Cl.[3] C12N 5/02
U.S. Cl. 435—241 **4 Claims**

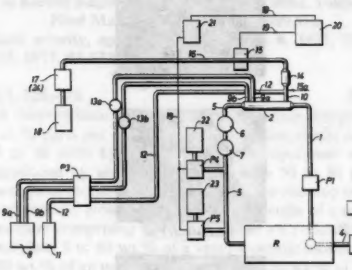
1. A culture medium for cultivating Limulus amebocytes,

comprising glucose, L-cystine, salts, vitamins, amino acids and horseshoe crab serum.

4,229,542
APPARATUS FOR THE MEASURING OF THE CONCENTRATION OF LOW-MOLECULAR COMPOUNDS IN COMPLEX MEDIA

Ulf T. G. Nylen, and Lars A. G. Qvarnström, both of Lund, Sweden, assignors to Gambro AB, Sweden

Filed Dec. 30, 1976, Ser. No. 755,977
Claims priority, application Sweden, Jan. 2, 1976, 7600024
Int. Cl.² C12M *1/34*
U.S. Cl. 435—291 **17 Claims**



1. Apparatus for sampling and measuring the content of a low-molecular weight compound in a complex fluid medium to be sampled, comprising:

a dialyzer having one or more semipermeable membranes having inlet and outlet means to be disposed within said complex fluid medium to form therein one or more passageways for the passage of dialysis fluid, said passageways being substantially smaller in volume than the volume of said complex fluid medium surrounding said passageways for dialyzing only a fractional portion of said complex fluid medium,

means for supplying said dialysis fluid through said passageways in said complex fluid medium such that only a fractional portion of said surrounding complex fluid medium is acted on by said dialysis fluid and dialyzed whereby a fractional portion of the low-molecular weight compound diffuses into said passageways containing said dialysis fluid to produce a dialysate in said passageways,

means for maintaining the pressure of said dialysis fluid within said passageways higher than the pressure of said complex fluid medium to substantially reduce ultrafiltration from said complex fluid medium to said dialysis fluid,

a reaction zone connected to said passageways including means for supplying enzyme under conditions sufficient for the enzyme to react with the dialysate, and

means connected to said reaction zone for measuring a property of said enzymatically reacted dialysate.

4,229,543
PROCESS FOR CULTURING METHANOL-UTILIZING YEASTS

Kenzo Tonomura, Chiba, and Teizi Urakami, Niigata, both of Japan, assignors to Agency of Industrial Science & Technology; Ministry of International Trade and Industry and Mitsubishi Gas Chemical Company, Inc., all of Tokyo, Japan

Continuation of Ser. No. 638,264, Dec. 8, 1975, abandoned, which is a continuation of Ser. No. 468,866, May 10, 1974, abandoned. This application Sep. 12, 1978, Ser. No. 941,641
Claims priority, application Japan, May 11, 1973, 48-53005
Int. Cl.² C12N *1/36, 1/32, 1/16*
U.S. Cl. 435—245 **10 Claims**

1. A process for shortening the growth induction period of methanol-utilizing yeasts which comprises preculturing a yeast capable of utilizing methanol in a seed culture medium containing methanol as a main carbon source in a concentration higher than 0.1 weight % and not more than 6 weight % and additionally containing nutrient nitrogen sources and inorganic compounds to obtain a seed yeast, inoculating the seed yeast into an aqueous nutrient fermentation medium containing methanol as a main carbon source, the methanol concentration in the seed culture liquor being within said range of higher than 0.1 weight % and not more than 6 weight % at the time of inoculation thereof into the fermentation medium, and cultivating the yeast in the fermentation medium in a continuous manner.

9. A process for shortening the growth induction period of the microorganism *Candida alcomigas* NRRL Y-8023 which comprises pre-culturing said microorganism in a seed culture medium containing methanol as a main carbon source in a concentration higher than 0.1 weight % and not more than 6 weight % and additionally containing nutrient nitrogen sources and inorganic compounds to obtain a seed yeast, and then inoculating and cultivating said seed yeast in an aqueous nutrient fermentation medium containing methanol as a main carbon source, the methanol concentration in the seed culture liquor being within said range of higher than 0.1 weight % and not more than 6 weight % at the time of inoculation thereof into the fermentation medium.

10. A process for shortening the growth induction period of the microorganism *Torulopsis methanofloat* NRRL Y-8028 which comprises pre-culturing said microorganism in a seed culture medium containing methanol as a main carbon source in a concentration higher than 0.1 weight % and not more than 6 weight % and additionally containing nutrient nitrogen sources and inorganic compounds to obtain a seed yeast, and then inoculating and cultivating said seed yeast in an aqueous nutrient fermentation medium containing methanol as a main carbon source, the methanol concentration in the seed culture liquor being within said range of higher than 0.1 weight % and not more than 6 weight % at the time of inoculation thereof into the fermentation medium.

4,229,544
LIVING ORGANISM PACKAGING

Robert W. Haynes, and William H. Rasmussen, both of East Grand Forks, Minn., assignors to Payfer Laboratories Inc., East Grand Forks, Minn.

Filed Aug. 8, 1978, Ser. No. 931,947
Int. Cl.² C12N *1/20, 1/00*
U.S. Cl. 435—253 **24 Claims**

1. A method of packaging living organisms consisting essentially of the steps of

mixing the living organisms with a carrier comprising substantially granular material suitable for maintaining the organisms in a viable condition over a long period of time,

disposing the organism-carrier mixture in a package,

providing a gaseous atmosphere in the package effective to induce and maintain substantial nonvegetative state formation of the organisms, and

sealing the package to prevent contamination of the atmosphere therein until breakage of the seal just before use of the organisms.

4,229,545
MATRIX AMPHOTERIC THERMALLY REGENERABLE ION EXCHANGE RESINS

Kurt H. Eppinger, Bentleigh, and Mervyn B. Jackson, West Brunswick, both of Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed Feb. 12, 1979, Ser. No. 11,667
Claims priority, application Australia, Feb. 27, 1978, PD3526
Int. Cl.² B01D *15/04*
U.S. Cl. 521—38 **15 Claims**

1. A process for the preparation of an amphoteric ion exchange resin comprising acidic and basic ion exchange components wherein particles comprising a polymeric acidic ion exchange material are suspended in a liquid phase comprising

a precursor material capable of being converted into a matrix of polymeric basic ion exchange material, and wherein the said precursor material which is monomeric or partially polymerized is caused to form a matrix which encapsulates the said particles characterised in that the matrix formation step is carried out in the presence of an inhibiting agent, said inhibiting agent being selected from the group consisting of a salt of a metal selected from the group of metals consisting of those defined in Groups 2A, 2B, 3A, 4A, 6B and 7B of the periodic table of elements and, a weakly basic organic material.

4,229,546

VISCOUS, FLOWABLE, PRESSURE-COMPENSATING FITTING COMPOSITIONS HAVING THEREIN BOTH GLASS AND RESINOUS MICROBEADS

Jack C. Swan, Jr., Boulder, Colo., assignor to Hanson Industries Incorporated, Boulder, Colo.

Division of Ser. No. 882,644, Mar. 2, 1978, which is a continuation-in-part of Ser. No. 723,912, Sep. 16, 1976, Pat. No. 4,108,928, which is a continuation-in-part of Ser. No. 663,213, Mar. 2, 1976, abandoned. This application Jul. 27, 1978, Ser. No. 928,563

Int. Cl.[3] **C08J** *9/32;* **C08L** *91/06*

U.S. Cl. 521—55 **39 Claims**

1. A viscous, flowable, pressure-compensating composition, which essentially consists of:

a substantially homogeneous, substantially stable, viscous, flowable, continuous phase formed of the combination of wax and oil, and, in combination therewith a discontinuous, microbead phase of particles of discrete, lightweight, sturdy, glass microbeads and lightweight, sturdy, resilient, resin microbeads which impart selected characteristics which are different than those associated with said glass microbeads, said glass and resin microbeads being substantially uniformly distributed in and having a lower density than said continuous phase with the combination of wax and oil;

said wax and oil phase being present in an amount sufficient (a) to more than merely thinly coat substantially the entire outer surface of essentially each of said microbeads or to more than merely form a film over the surface of essentially each of said microbeads, and (b) to provide a volume that is substantially more than the volume of the interstitial space of the quantity of microbeads alone;

said composition being characterized by being a viscous, flowable and thus deformable, and pressure-compensating composition having a specific gravity in the vicinity of about 0.8, or less, having a substantially homogeneous consistency and not substantially changing in volume responsive to ambient temperatures or ambient temperature changes, being resistant to sag, flowing in response and conformance to continuously applied pressure, flowing under shear stress after its yield point is reached, and, when confined during conditions of use, being resistant to flow in response to instantaneously applied pressure, having resilient characteristics in that it is momentarily or slowly, at least in part, recoverable from deformation upon or following the relief of deforming pressure loads, and undergoing flow and deformation away from areas of highest pressure loads.

4,229,547

METHOD OF PREPARING SPHERICAL POROUS BEAD-TYPE POLYMERS

Louis Cohen, Avon Lake, and Pijus K. Basu, Brecksville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 19, 1979, Ser. No. 21,399

Int. Cl.[2] **C08F** *2/20;* **C08J** *9/00*

U.S. Cl. 521—69 **24 Claims**

1. In a process for polymerizing one or more vinylidene monomers having a terminal $CH_2{=}C<$ grouping in the form of discrete droplets containing a monomer-soluble free radical-type catalyst while suspended in an aqueous mucilage having plastic flow properties, said droplets being polymerized while moving under plastic flow in the substantial absence of shear forces, and said mucilage comprising a water-insoluble, water-swellable lightly cross-linked polymer of one or more olefinically unsaturated carboxylic acid monomers containing sufficient water to form a flowable plastic mass, the improvement comprising conducting said polymerization in the presence of a nonionic surfactant having a Hydrophile-Lipophile Balance in the range of about 1 to about 17, thereby producing spherical beads of polymer having high porosity and high bulk density.

4,229,548

PROCESS FOR THE PREPARATION OF ORGANOPOLYSILOXANE MOULDING COMPOSITIONS WHICH GIVE FINE-PORED ELASTOMERIC FOAM MOULDINGS

Hans Sattlegger, Odenthal; Hermann Schmidt, Linz, and Karl Schnurrbusch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,765

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834119

Int. Cl.[2] **C08J** *9/30*

U.S. Cl. 521—110 **10 Claims**

1. In a process for the production of a plastic organopolysiloxane molding composition which can be stored under pressure and with exclusion of moisture, and which, on release of the pressure and under the action of water or atmospheric moisture, is converted into an elastomeric, fine-pored foam molding or foam coating, which comprises forming an mixture of an α,ω-dihydroxypolydiorganopolysiloxane with a

silicon-containing crosslinking agent, introducing the mixture into the inner container of a two-container pack which consists of a rigid outer container and a flexible inner container located within the outer container and provided with a dispensing valve which extends to the exterior, and placing the mixture under a moisture-free inert gaseous pressure of about 2 to about 30 bar.

4,229,549

THERMOPLASTIC RESIN COMPOSITION COMPRISING A RIGID THERMOPLASTIC RESIN AND A GRAFT COPOLYMER

Seiji Usami; Masanori Oota, both of Iwaki; Hitoshi Takita, Tokyo, and Hideyuki Hashizume, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1978, Ser. No. 889,116

Claims priority, application Japan, Apr. 8, 1977, 52-40074; Apr. 15, 1977, 52-43202

Int. Cl.[2] C08L 51/00

U.S. Cl. 525—76 **8 Claims**

1. A thermoplastic resin composition, which comprises:

97 to 70 parts per weight of a rigid thermoplastic resin and 3 to 30 parts by weight of a graft copolymer which is produced by graft-polymerizing onto 50 to 80 parts by weight of an elastic trunk polymer, by a one step or multistep process, from 50 to 20 parts by weight of a monomer mixture comprising 10 to 95 wt.% of a C_1–C_4 alkyl methacrylate, 0 to 80 wt.% of a vinyl aromatic monomer, 0 to 50 wt.% of an unsaturated nitrile, 0 to 30 wt.% of a monomer selected from the group consisting of acrylic acid, acrylic acid esters, acrylamide, methacrylic acid, methacrylic acid esters excluding C_1–C_4 alkyl methacrylates, methacrylamide, alkylvinyl ethers, and alkylvinyl esters and 0 to 5 wt.% of a polyfunctional monomer containing at least two olefinic groups, said elastic trunk polymer comprising 60 to 99.5 wt.% of a C_2–C_{12} alkylacrylate component, 0.1 to 10 wt.% of a polyfunctional monomer component being an alcohol, ester, ether or hydrocarbon compound having at least one conjugated double bond and at least one non-conjugated double bond and 0 to 35 wt.% of a comonomer component selected from the group consisting of 1, 3-butadiene, isoprene, chloroprene, an aromatic vinyl compound, an alkylmethacrylate, acrylic acid, methacrylic acid, glycidyl esters of acrylic acid and methacrylic acid, an unsaturated nitrile, a vinyl ether, a vinyl halide, a vinylidene halide, a vinyl ester, a polyvinyl compound, a polyhydric alcohol acrylate, a polyhydric alcohol methacrylate and an allyl compound.

4,229,550

FLEXIBILIZED VINYL POLYBUTADIENE MALEIMIDE RESINS

Robert J. Jones, Hermosa Beach; Robert W. Vaughan, Manhattan Beach; Robert A. Buyny, Redondo Beach, and Michael K. O'Rell, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

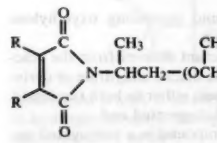
Filed Dec. 11, 1978, Ser. No. 968,331

Int. Cl. C08f 279/02

U.S. Cl. 525—282 **33 Claims**

1. A peroxide curable composition comprising the reaction product of a vinyl polybutadiene reactant having pendant vinyl groups capable of high temperature peroxide cure and a maleimide reactant selected from the group consisting of:

(i) an aliphatic bismaleimide of the general formula:



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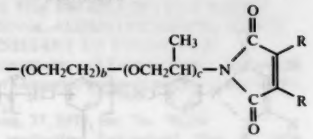
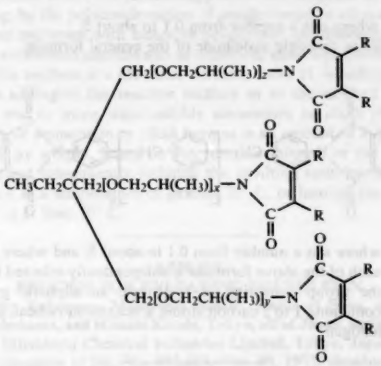


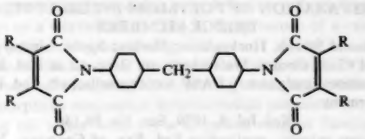
wherein a+c is from about 1 to about 5 and b is from about 13.5 to about 45.5;

(ii) an aliphatic trismaleimide of the general formula:

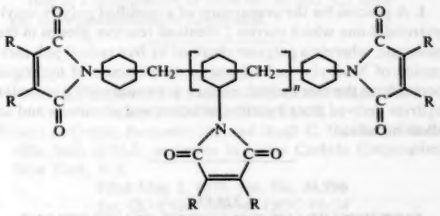


wherein the sum of x, y and z is about at least 1;

(iii) a cycloaliphatic maleimide of the general formula:

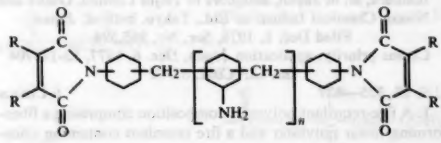


(iv) a cycloaliphatic maleimide of the general formula:



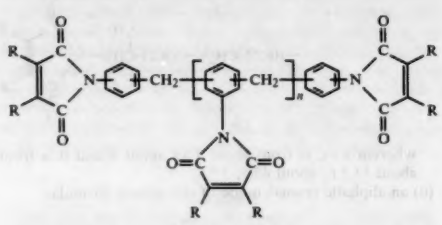
where n is a number from about 0.1 to about 5;

(v) a cycloalphatic maleimide of the general formula:

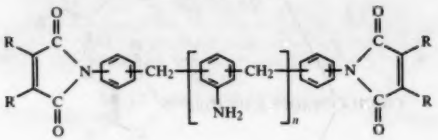


where n is a number from 0.1 to about 5;

(vi) an aromatic maleimide of the general formula:



where n is a number from 0.1 to about 5;
(vii) an aromatic maleimide of the general formula:



where n is a number from 0.1 to about 5; and where R in each of the above formulas is independently selected from the group consisting of hydrogen, an aliphatic group containing 1 to 2 carbon atoms, a benzenoid radical, and a halogen

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4,229,551

PREPARATION OF MODIFIED POLYMERS OF N-VINYLPYRROLID-2-ONE AND THEIR USE FOR THE PREPARATION OF POLYMERS INTERRUPTED BY BRIDGE MEMBERS

Ferdinand Straub, Hockenheim; Herbert Spoor, Limburgerhof, and Claus Cordes, Weisenheim am Berg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 56,136

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831335

Int. Cl. C08f *8/04, 8/42, 8/00*

U.S. Cl. 525—337 **5 Claims**

1. A process for the preparation of a modified poly-N-vinylpyrrolid-2-one which carries 2 identical reactive groups in the molecule, wherein a polymer obtained by free radical polymerization of N-vinylpyrrolid-2-one in the presence of hydrogen peroxide as the free radical initiator is treated with a complex hydride derived from hydrides of boron and aluminum and an alkali metal ion.

4,229,552

FIRE-RETARDANT POLYESTER COMPOSITIONS

Masahiro Shiozaki, Yokohama; Kiyoshi Nawata; Kiyokazu Tsunawaki, both of Matsuyama; Kazumi Tsubaki, Ichihara; Akira Yanagimoto, Ichihara, and Shunichi Kumazawa, Ichihara, all of Japan, assignors to Teijin Limited, Osaka and Nissan Chemical Industries Ltd., Tokyo, both of, Japan

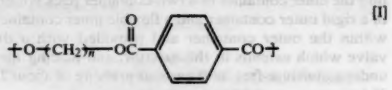
Filed Dec. 1, 1978, Ser. No. 965,396

Claims priority, application Japan, Dec. 6, 1977, 52-145704

Int. Cl.[2] C08L *67/02*

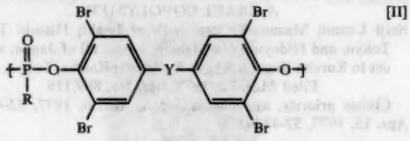
U.S. Cl. 525—437 **6 Claims**

1. A fire-retardant polyester composition comprising a fiber-forming linear polyester and a fire retardant containing phosphorus and bromine, wherein at least 70 mole% of the polyester consists of a recurring unit of the formula



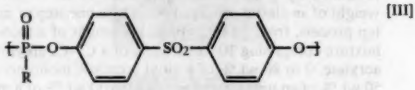
[I]

wherein n represents an integer of 2 to 6,
and the fire retardant is a copolyphosphonate composed of 1 mole of a recurring unit of the formula



[II]

wherein Y represents an isopropylidene or sulfonyl group, and
R represents a phenyl or benzyl group,
and 0.25 to 10 moles of a recurring unit of the formula



[III]

wherein R represents a phenyl or benzyl group,
the proportion of the fire retardant being 1 to 20 parts by weight per 100 parts by weight of the polyester.

4,229,553

STABILIZED POLY(ALKYLENE TEREPHTHALATE) MOLDING MATERIALS

Hans-Josef Sterzel, Dannstadt-Schauernheim; Rolf Wurmb, Heidelberg; Franz Schmidt, Mannheim, and Erhard Seiler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,130

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834032

Int. Cl.[2] C08L *63/00*

U.S. Cl. 525—438 **6 Claims**

1. A poly(alkylene terephthalate) molding material which contains, as the stabilizer, from 0.1 to 3.0 percent by weight of a diepoxide of molecular weight from 200 to 2,000, as well as a catalyst, wherein the catalyst consists of from 0.001 to 0.5 percent by weight, based on the molding material, of an alkali metal salt of a chelating agent which possesses one or more $-N(CH_2-COO^-)_2$ groups in the molecule.

4,229,554

FLAME RETARDANT ANTISTATIC ADDITIVES AND ANTISTATIC FIBERS

David D. Newkirk, Southgate; Robert B. Login, Woodhaven, and Basil Thir, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 2, 1976, Ser. No. 746,723

Int. Cl.[3] C08F *283/02;* **C08G** *63/76, 69/44*

U.S. Cl. 525—438 **7 Claims**

1. A flame-retardant antistatic polymer comprising the reaction product of

(a) a polyoxyalkylene compound containing oxyethylene and oxypropylene groups with

(b) a halogenated polyester reactant derived from the reaction of an aliphatic or aromatic diacid, anhydride or derivative thereof and a diol, wherein either or both the diacid, the anhydride or the diol is halogenated and

wherein said polyoxyalkylene compound is a conjugated po-

lyoxyalkylene compound, obtained by block polymerization or heteric polymerization and having as a nucleus a nitrogen containing reactive hydrogen compound.

4,229,555

LINEAR POLYESTER COIL COATING COMPOSITIONS

Michael A. Tobias, Bridgewater, and Conrad L. Lynch, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 914,640, Jun. 12, 1978. This application Jul. 26, 1979, Ser. No. 61,145

Int. Cl.[2] C08G *63/76*

U.S. Cl. 525—443 15 Claims

1. A linear thermosettable polyester resin derived from a reaction mixture comprising:

(a) between about 38 and 43 percent by weight of a short chain alkylene diol component;

(b) between about 11 and about 17 percent by weight of an alkyl dicarboxylic acid having 4 to 7 carbon atoms in the primary carbon chain between the two carboxylic acid groups;

(c) between about 40 and 47 percent by weight of a benzenedicarboxylic acid component; and

(d) said polyester resin having a number average molecular weight of from about 1,500 to about 5,000 and a combined acid and hydroxyl number of about 20 to about 60 milligrams of KOH per gram of polyester.

9. A coating composition comprising the polyester resin of claim 1, between about 5 and about 35 weight percent of an aminoplast cross-linking agent on resin solids, between about 0.1 and about 1.0 weight percent of an acid catalyst on resin solids, and an inert organic solvent in an amount sufficient to provide a solids content of between about 25 weight percent and about 55 weight percent, based on the weight of the composition.

4,229,556

REACTIVE OLIGOMERS AS CURING AGENT FOR UNSATURATED POLYESTER

Dietrich Braun, Darmstadt-Arheilgen, and Klaus Titzschkau, Darmstadt, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

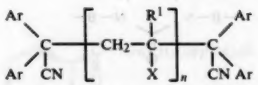
Filed Jan. 23, 1979, Ser. No. 5,770

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803494; Feb. 13, 1978, 2805904

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—445 7 Claims

1. In the process of curing a solution of an α-β ethylenically unsaturated polyester in at least one vinyl or vinylidene compound which is copolymerizable therewith, in the presence of a non-peroxidic initiator at a temperature of from 60°–200° C., said α-β ethylenically unsaturated polyester being the polycondensation product of at least one α-β ethylenically unsaturated dicarboxylic acid or ester-forming derivative thereof and at least one polyhydroxy compound, the improvement which comprises initiating polymerization with an oligomer of the formula



wherein Ar is aryl, R^1 is alkyl, X is CN or $COOR^2$ wherein R^2 is hydrogen or alkyl having 1 to 12 carbon atoms and n is a number from 1 to 20.

4,229,557

PROCESS FOR THE PRODUCTION OF WHITE MELAMINE-PHENOL-ALDEHYDE RESINS WHICH ARE RESISTANT TO YELLOWING

Dieter Feinauer, Lampertheim, and Ludwig Streinz, Mannheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,216

Claims priority, application Switzerland, Sep. 6, 1978, 9364/78

Int. Cl.[2] C08G *14/10*

U.S. Cl. 525—480 16 Claims

1. A process for the production of melamine-phenol-aldehyde resins which are substantially white and resistant to yellowing, by the polycondensation of unsubstituted or alkyl-substituted melamine with mono- or polyhydric, unsubstituted or alkyl-substituted phenols and an aldehyde, in an aqueous basic reaction medium at a pH value between 8 and 11, which comprises adding to the reaction mixture or to the isolated dry resin one or more water-soluble ammonium or alkali phosphates or ammonium or alkali borates in an amount of at least 0.05% by weight, based on the reaction mixture or the dry resin, and subsequently isolating the resulting resin by dehydration at a temperature of at least 70° C. or heating the dry resin to at least 70° C.

4,229,558

PROCESS FOR PREPARING POLYOLEFIN

Genjiro Kakogawa; Masayoshi Hasuo; Yoshinori Suga, all of Yokohama, and Hisashi Kitada, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 855,683, Nov. 29, 1977, abandoned. This application Aug. 30, 1979, Ser. No. 71,388

Claims priority, application Japan, Dec. 13, 1976, 51-149529

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—125 7 Claims

1. A process for preparing polyolefins by polymerizing an α-olefin or a mixture of α-olefin in the presence of a catalyst system prepared by combining:

(i) an aluminum-free, titanium-containing, solid catalytic component prepared by contacting an ether suspension of amorphous magnesium hydroxyhalide prepared by reacting (a) water with (b) a Grignard reagent having the formula R'MgX wherein R' is a hydrocarbon moiety and X is a halogen atom at a temperature of from 20° to 200° C. and (d) a carboxylic ester with (c) titanium tetrachloride at a temperature of from 60° to 200° C.; with

(ii) an organoaluminum compound.

4,229,559

NOVEL BIS(HALF ESTER) AND COMPOSITIONS CONTAINING THE SAME

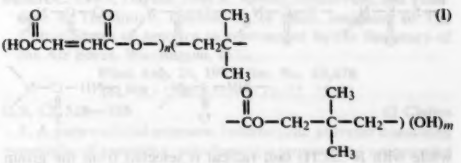
Robert J. Cotter, Bernardsville, and Hugh C. Gardner, Somerville, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 1, 1979, Ser. No. 34,996

Int. Cl.[2] C08F *222/12;* C07C *69/34*

U.S. Cl. 526—271 6 Claims

1. A half ester characterized by the following empirical formula:



(I)

wherein n is a number having an average value of 1.7 to 2 and m is equal to 2—n.

4,229,560

THERMOSTABLE NITROGEN CONTAINING HETEROCYCLIC POLYMERS AND PROCESS FOR PRODUCING

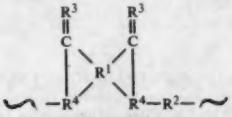
Alexei Y. Chernikhov, prospekt Vernadskogo, 93, kv. 64; Mikhail N. Yakovlev, ulitsa Amurskaya, 8, kv. 93, both of Moscow; Valentina B. Lysova, ulitsa Juzhnaya, 22, kv. 59, Moskovskaya oblast, Pavlovsky posad; Evgeny L. Gefter, B. Dorogomilovskaya ulitsa, 56, kv. 60, and Nina N. Shmagina, ulitsa Moldogulovoi, 8, korpus 1, kv. 66, both of Moscow, all of U.S.S.R.

Filed May 30, 1978, Ser. No. 910,298

Int. Cl.[2] C08G *73/06*

U.S. Cl. 528—4 **8 Claims**

1. A thermostable heterocyclic polymer, consisting essentially of units having the general formula

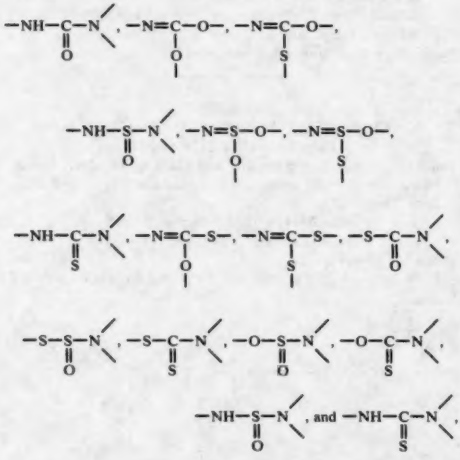


where R^1 and R^2 denote an organic radical selected from the group consisting of radicals which incorporate from 2 to 1000 carbon atoms and;

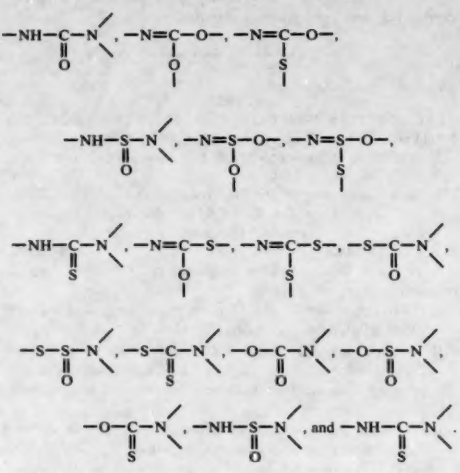
a radical selected from the group consisting of radicals which have from 2 to 1000 carbon atoms; said radical containing at least one of the following elements: Si, F, Cl, Br, N, S, P, B, O, each of said elements being present in an amount of from 1 to 1000 atoms;

R^3 is a radical selected from the group consisting of NH and, CH_2;

R^4 is a radical which (with R^3=NH) is selected from the group, consisting of



while with R^3=CH_2 said radical is selected from the group consisting of



4,229,561

POLYUREA POLYMER PREPARED FROM POLYETHERS HAVING HETEROCYCLIC GROUPS AND TERMINAL AMINO GROUPS

Oskar Schmidt, Kittsee, and Walter Sibral, Tulln, both of Austria, assignors to Lim-Holding, S.A., Luxembourg, Luxembourg

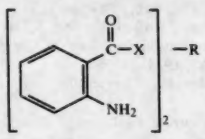
Continuation-in-part of Ser. No. 965,140, Nov. 29, 1978, which is a division of Ser. No. 735,282, Oct. 26, 1976, Pat. No. 4,139,706.

This application Apr. 13, 1979, Ser. No. 29,961

Int. Cl.[3] C08G *18/32*

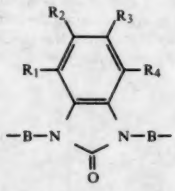
U.S. Cl. 528—68 **20 Claims**

1. Plastic materials produced according to the isocyanate polyaddition process by reacting compounds having terminal amino groups, said compounds being of the general formula



(I)

wherein X is oxygen or sulfur and R represents a group of the formula



(II)

wherein R_1 and R_4 are hydrogen and halogen and B stands for a divalent polyalkylene ether group or a polyalkylene thioether group obtained by removal of the hydroxyl or mercapto groups from a polyalkylene ether diol or from a po-

lyalkylene thioether dithiol of a molecular weight of 100 to 15000, with a polyisocyanate.

4,229,562

POLYURETHANES BASED ON HIGH MOLECULAR WEIGHT FORMYL ALCOHOLS

Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 4, 1979, Ser. No. 26,856
Int. Cl.[2] C08G *18/14, 18/64*
U.S. Cl. 528—85 19 Claims

1. The urethane linked reaction product of a gem-bis(hydroxymethyl) alcohol of the formula:

$$CH_3(CH_2)_m[C(CH_2OH)_2]_n(CH_2)_p[C(CH_2OH)_2]_q(-CH_2)_r[C(CH_2OH)_2]_s(CH_2)_tCH_2OH$$

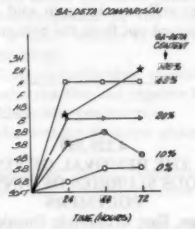
and from about 80% to about 120% on a hydroxyl-isocyanate equivalent basis of a polyisocyanate wherein n, q and s are integers the sum of which is from 1 to 3, and m through t are integers the sum of which is from 12 to 20.

4,229,563

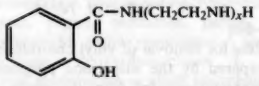
AROMATIC AMIDOAMINES

Raymond E. Foscante, Yorba Linda; Albert P. Gysegem, Monrovia, and Pamela J. Martinich, Long Beach, all of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Continuation of Ser. No. 835,145, Sep. 21, 1977, abandoned. This application Aug. 3, 1979, Ser. No. 63,190
Int. Cl.[2] C08G *59/44*
U.S. Cl. 528—99 24 Claims

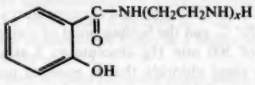


1. An amine adduct of orthohydroxybenzoic acid of the formula:



where x is from 2 to about 8, and the hydroxyl group is in the ortho position.

7. A method for preparing a polymeric product comprising the step of curing an epoxy resin with a curing agent having the formula:



where x is from 2 to about 8.

4,229,564

FRIEDEL-CRAFTS POLYMERIZATION OF MONOMERS IN THE PREPARATION OF POLYKETONES AND POLYSULFONES

Klaus J. Dahl, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 597,496, Jul. 21, 1975, Pat. No. 4,111,908, and Ser. No. 451,521, Mar. 15, 1974, Pat. No. 3,953,400, which is a continuation-in-part of Ser. No. 218,465, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 115,824, Feb. 17, 1971, abandoned, said Ser. No. 597,496, is a division of Ser. No. 366,326, Jun. 4, 1973, Pat. No. 3,914,298, which is a division of Ser. No. 218,466, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 115,824,. This application Apr. 26, 1976, Ser. No. 680,068
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.[2] C08G *67/00, 75/20*
U.S. Cl. 528—175 29 Claims

1. A process for producing a polymer comprising polymerizing at least one monomer under Friedel-Crafts conditions, said monomer having both an electrophillic and a nucleophillic reaction center under said Friedel-Crafts conditions, the electrophillic center on one monomer molecule reacting with the nucleophillic center on another to propagate said polymer, in the presence of a molecular weight control agent that reacts only as a nucleophile under the reaction conditions.

4,229,565

PREPARATION OF POLYARYLATES FROM DIHYDRIC PHENOLS, AROMATIC DICARBOXYLIC ACID AND A CHLORINATING AGENT

Hugh C. Gardner, Somerville, and Markus Matzner, Edison, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 911,526, Jun. 1, 1978, abandoned. This application May 14, 1979, Ser. No. 37,991
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—176 13 Claims

1. A method for preparing polyarylates which comprises:
(a) mixing at least one aromatic dicarboxylic acid having 8 to about 20 carbon atoms with a stoichiometric excess of a chlorinating agent,
(b) heating the mixture from (a) at a temperature of about 25° to about 180° C., until essentially all of the dicarboxylic acid groups are reacted,
(c) removing unreacted chlorinating agent,
(d) determining the amount of active chlorine in the resultant mixture,
(e) adding an approximately stoichiometric amount of at least one dihydric phenol, based on the amount of active chlorine present, and
(f) polymerizing the mixture from step (e) until a polyarylate having a reduced viscosity of at least 0.4 in p-chlorophenol at 49° C. at a concentration of 0.2 g/dl. forms.

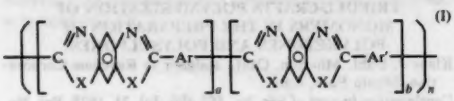
4,229,566

ARTICULATED PARA-ORDERED AROMATIC HETEROCYCLIC POLYMERS CONTAINING DIPHENOXYBENZENE STRUCTURES

Robert C. Evers, Dayton; Fred E. Arnold, Centerville, and Thaddeus E. Helminiak, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

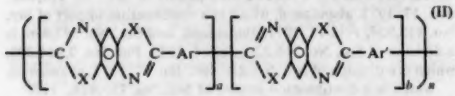
Filed Aug. 24, 1979, Ser. No. 69,476
Int. Cl.[2] C08G *73/18, 73/22, 75/32*
U.S. Cl. 528—185 13 Claims

1. A para-ordered aromatic heterocyclic polymer consisting essentially of repeating units having a structure as represented by one of the following formulas:



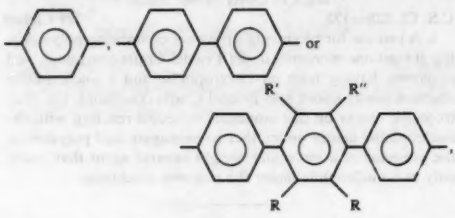
(I)

or

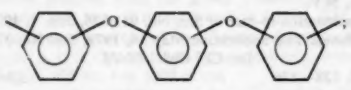


(II)

wherein X in each formula is O, S or NH; Ar is



where R is a monovalent aromatic radical and R′ and R″ are individually selected from the group consisting of hydrogen, a monovalent aromatic radical, a monovalent aliphatic radical, a monovalent cycloaliphatic radical, and a monovalent heterocyclic radical; Ar′ is



a ranges from about 0.75 to 0.97, b ranges from about 0.03 to 0.25, and the sum of a and b equals 1; and n is an integer equal to the number of repeating units.

4,229,567

COPOLYAMIDE RESINS FROM PIPERAZINE AND POLYOXYALKYLENE DIAMINE HAVING IMPROVED CREEP RESISTANCE

Hubert J. Sharkey, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

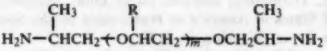
Filed Feb. 8, 1979, Ser. No. 11,456
Int. Cl.[2] C08G *69/26*
U.S. Cl. 528—338 **9 Claims**

1. A thermoplastic copolyamide adhesive resin having improved creep resistance consisting essentially of the polymeric reaction product of essentially stoichiometric amounts of:

(a) a mixture of saturated aliphatic dicarboxylic acids containing a short-chain dicarboxylic acid having from 2 to 7 carbon atoms and a long-chain dicarboxylic acid having from 8 to 14 carbon atoms;

(b) piperazine; and

(c) a polyoxyalkylene diamine of the general formula



where R is hydrogen or a methyl group and m is a positive integer such that the average molecular weight of the polyoxyalkylene diamine is between about 200 and 800; the equivalents ratio of the long- to short-chain dicarboxylic acids ranging from 0.5:0.5 to 0.9:0.1 and the equivalents ratio of the piperazine to polyoxyalkylene diamine ranging from 0.7:0.3 to 0.95:0.05.

4,229,568

METHOD OF DISCHARGING GASEOUS VINYL CHLORIDE MONOMER FROM A POLYMERIZATION REACTOR

Norinobu Wada, Ibaragi, and Yoshihiro Shirota, Yokohama, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Continuation of Ser. No. 830,066, Sep. 2, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,570
Claims priority, application Japan, Sep. 16, 1976, 51-111215
Int. Cl.[2] C08F *6/24*
U.S. Cl. 528—500 **3 Claims**

1. Method for the production of a polymerizate of vinyl chloride monomer or a monomer mixture mainly composed thereof by polymerization in an aqueous medium contained in polymerization reactor which comprises the successive steps of (a) equilibrating the pressure inside said reactor and a receiver tank connected to said reactor after completion of the polymerization reaction, (b) removing most of the unreacted gaseous vinyl chloride monomer vapors out of said reactor, (c) transferring the aqueous dispersion of polymerizate from said reactor into said receiver tank, (d) opening said reactor to ambient atmosphere, and (e) blowing steam into said reactor from the top of the reactor prior to the step (d) of opening said reactor to ambient atmosphere at a linear velocity of steam blown into said polymerization reactor which does not exceed 150 m/second as determined at a blowing nozzle, and further at a rate of steam blown into said polymerization reactor which does not exceed 300 kg/hour per square meter of the horizontal cross sectional area of said reactor, whereby any unreacted gaseous monomer still remaining in said reactor is pushed downward and moved out from the bottom of said reactor.

4,229,569

PROCESS FOR THE REMOVAL OF VINYL CHLORIDE FROM AQUEOUS SLURRIES OF VINYL CHLORIDE POLYMERS

Martin L. Feldman, East Brunswick; Donald Goodman, Flemington; Marvin Koral, Warren; Robert S. Miller, Bridgewater, and Robert J. Stanaback, Gladstone, all of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 482,112, Jun. 24, 1974, abandoned. This application Feb. 5, 1979, Ser. No. 9,328
Int. Cl.[3] C08F *6/24, 14/06*
U.S. Cl. 528—501 **4 Claims**

1. The process for removal of vinyl chloride from an aqueous slurry prepared by the suspension polymerization of a monomer component selected from the group consisting of vinyl chloride and mixtures of vinyl chloride with up to 35% by weight of at least one monomer copolymerizable therewith, said slurry containing from 5% to 50% by weight of vinyl chloride polymer particles ranging in size from about 25 microns to 500 microns, from 1000 parts to 15,000 parts by weight of vinyl chloride per million parts by weight of polymer in the slurry, and not more than 0.1% by weight of surfactant, that comprises the steps of heating said aqueous slurry at a temperature between 70° C. and the boiling point of water at a pressure in the range of 300 mm Hg absolute to 3 atmospheres and removing the vinyl chloride that is evolved until the slurry contains less than 0.1 ppm of vinyl chloride, based on the weight of polymer in the slurry.

4,229,570

METHOD OF PRODUCING NITROGEN-CONTAINING POLYSACCHARIDES

Saburo Ueno, Tokyo; Chikao Yoshikumi, Kunitachi; Fumio Hirose, Tokyo; Yoshio Omura, Tanashi; Toshihiko Wada, Mibu; Takayoshi Fujii, Tokyo, and Eiichi Takahashi, Kawaguchi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1977, Ser. No. 788,991
Claims priority, application Japan, Jul. 7, 1976, 51-80665
Int. Cl.[2] A61K *31/73*; C07H *1/08*
U.S. Cl. 536—18 4 Claims

1. A method of providing a nitrogen-containing polysaccharide substantially free from units having a molecular weight below about 5000 which comprises extracting said nitrogen-containing polysaccharide from a fungus of the genus Coriolus of the family Polyporaceae of the class Basidomycetes at a temperature of 50° to 100° C. wherein:

(a) a first extraction step is conducted with water or a dilute aqueous alkaline solution;

(b) a second extraction step is conducted in an alkaline medium having a normality higher than said first extraction step and below about 2.0; and

(c) a third extraction step is conducted at a normality higher than said second extraction step and below about 2.0.

4,229,571

GLUCOCORTICOID SPARING FACTOR AND PROCESS FOR THE PRODUCTION OF THE SAME

Nobuhiko Katsunuma, No. 1-78, Shōmachi, Tokushima-shi, Tokushima-ken, Japan

Filed Aug. 10, 1978, Ser. No. 933,083
Claims priority, application Japan, Aug. 16, 1977, 52-98110
Int. Cl.[2] A61K *31/70*
U.S. Cl. 536—18 8 Claims

1. A glucocorticoid sparing factor characterized in that:

it is a colorless and acidic substance produced in a culture broth of a microorganism of the Family Enterobacteriaceae and is easily soluble in water and in diluted aqueous acid or alkali;

it is positive to 1,10-phenanthroline reaction, Orcinol reaction and Anthrone reaction and negative to Folin-Thiocalt reaction and Elson-Morgan reaction;

it has a molecular weight between about 800 and about 1,500;

it is an oligosaccharide having N-acetylneuraminic acid, pentose, hexose and a primary amine as constructing moieties;

it indicates in vivo an amplifying action in the induction if tyrosine transaminase and leucine transaminase by glucocorticoid in the liver of adrenalectomized rat, with said amplifying action being deactivated by the action of α-glucosidase, but not being affected by the action of α-amylase, neuraminidase, hyaluronidase, lysozyme, chymotripsin, trypsin, pepsin, proteinase, papain, collagenase, aminopeptidase M, carboxypeptidases A and B, leucine-aminopeptidase, deoxyribonuclease 1, ribonuclease T_1+A, acid phosphatase or alkali phosphatase;

it does not influence induction of liver tyrosine transaminase in adrenalectomized rat when administered alone nor does it influence such induction by glycagon or insulin;

it indicates an amplifying action on the induction of tyrosine transaminase by glycocorticoid in an in vitro system using the liver of an adrenalectomized rat under the perfusion method when added to the system prior to or at the same time as the administration of glucocorticoid;

it is stable for more than 6 months at −20° C;

it is stable for minimum 48 hours in a buffer solution having a pH of 4.2–9 at 37° C.;

it is deactivated to form reducing sugar when heated at 105° C. for 12 hours in 6N hydrochloric acid;

it has shoulder at 265 nm in untraviolet absorption spectrum and, after purification in a proper manner, a sharp peak appears at the same wavelength; and

it has an Rf of about 0.16 as measured by ascending method using filter paper and acetic acid-n-butanol-water (3:12:5, v/v) as a developing agent.

4,229,572

PURIFICATION OF CELLULOSE ETHER REACTION PRODUCT

Maurice L. Zweigle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 5, 1979, Ser. No. 17,520
Int. Cl.[3] C08B *11/20*
U.S. Cl. 536—89 17 Claims

1. A method for reducing the content of alkali metal, in salt or hydroxide form, in an organosoluble cellulose ether, said method comprising

a. preparing a solution of the cellulose ether, which cellulose ether contains alkali metal, and an organic solvent;

b. converting the alkali metal hydroxide present in the solution to an alkali metal salt;

c. heating the resulting solution at conditions such that (1) any water present in the solution is removed therefrom and (2) the alkali metal salt particles grow; and

d. separating the cellulose ether from the enlarged salt particles.

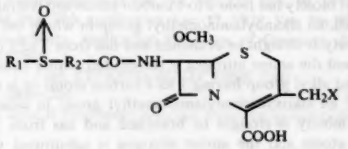
4,229,573

7α-METHOXYCEPHALOSPORIN DERIVATIVES

Chisei Shibuya; Hirataka Itoh; Kunihiko Ishii; Torao Ishida, and Mitsuru Shibukawa, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1977, Ser. No. 808,631
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—21 10 Claims

1. A 7α-methoxycephalosporin or its pharmacologically acceptable salts of the formula



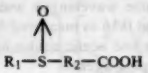
wherein

R_1 is selected from the group consisting of 2-thienyl, 3-thienyl, 4-pyridyl, N-oxo-2-pyridyl, N-oxo-4-pyridyl, 5-methyl-1,3,4-thiadiazol-2-yl, 1,3,4-thiadiazol-2-yl, 1-methyl-1H-tetrazol-5-yl, 6-methyl-1-oxopyridazin-3-yl, benzimidazol-2-yl, 2-furyl and 2-thienylmethyl;

R_2 is methylene; and

X is selected from the group consisting of acetoxy, carbamoyloxy, methoxy, methylthio, 1-methyl-1H-tetrazol-5-ylthio, 5-methyl-1,3,4-thiadiazol-2-ylthio, 1H-tetrazol-5-ylthio, 3-methyl-1,2,4-thiadiazol-5-ylthio, 1,3,4-thiadiazol-2-ylthio, 1,3,4-oxadiazol-2-ylthio, 1H-1,3,4-triazol-2-ylthio, 1H-1,2,3-triazol-5-ylthio, 1-ethyl-1H-tetrazol-5-ylthio, N-oxopyridin-2-ylthio, 1-carboxymethyl-1H-tetrazol-5-ylthio, 5-(N,N-dimethylamino)-1,3,4-thiadiazol-2-ylthio and 6-methyl-1-oxopyridazin-3-ylthio; and

wherein said R form means an optical isomer having stereochemically the same structure in the sulfinyl group as that optical isomer of the two sulfinyl group stereoisomers of a compound of the formula (II) which has a positive specific rotation in ethanol:



wherein R_1 and R_2 are the same as defined above.

4,229,574

INDOLE CEPHALOSPORIN DERIVATIVES

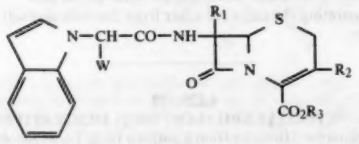
Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziyona, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Division of Ser. No. 947,541, Oct. 2, 1978, which is a division of Ser. No. 858,630, Dec. 8, 1977, Pat. No. 4,139,703. This application Aug. 23, 1979, Ser. No. 68,888

Int. Cl.[2] C07D *501/56*

U.S. Cl. 544—21 **5 Claims**

1. A compound selected from the formula



wherein W is hydrogen, a $-CO_2R_4$ group wherein R_4 is hydrogen, a straight or branched 1 to 4 carbon alkyl group, a straight or branched alkanoyloxymethyl group in which the alkanoyl group has from 2 to 5 carbon atoms; R_1 is hydrogen or methoxy; R_2 is chloro, bromo or methoxy, R_3 is hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, a straight or branched alkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen is substituted with a straight or branched alkyl group having 1 to 4 carbon atoms or is unsubstituted; an alkoxycarbonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen is substituted with a straight or branched alkyl group of from 1 to 4 carbon atoms or is unsubstituted, p-(alkanoyloxy)benzyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms; an aminoalkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 15 carbon atoms and the amino nitrogen is mono- or di-substituted with a straight or branched alkyl group having from 1 to 4 carbon atoms or is unsubstituted; or pharmaceutically acceptable salts thereof.

4,229,575

7-(2,3-DIHYDROBENZO-5-FURANYL)-ACETAMIDO CEPHALOSPORIN DERIVATIVES

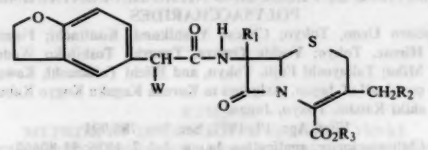
Ekkehard H. Böhme, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Feb. 27, 1978, Ser. No. 881,611

Int. Cl.[2] C07D *501/56*

U.S. Cl. 544—27 **11 Claims**

1. A compound selected from the formula



wherein W is selected from the group consisting of H, $-NHR_4$, —OH, $-CO_2R_5$ and $-SO_3R_5$, wherein R_4 is hydrogen, a straight or branched 2 to 5 carbon alkanoyl group or an alkoxycarbonyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and R_5 is hydrogen or a straight or branched alkyl group of from 1 to 4 carbon atoms; R_1 is hydrogen or methoxy, R_2 is selected from the group consisting of hydrogen, an alkanoyloxy group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and a heterocyclic thio group selected from the group consisting of 1,3,4-thiadiazol-2-ylthio, 5-methyl-1,3,4-thiadiazol-2-ylthio, 1,3,4-oxadiazol-2-ylthio, 5-methyl-1,3,4-oxadiazol-2-ylthio, tetrazol-5-ylthio, 1-methyltetrazol-5-ylthio, 1,2,3-triazol-5-ylthio and 1-methyl-1,2,3-triazol-5-ylthio; R_3 is selected from the group consisting of hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, an alkanoyloxymethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms, an alkanoylaminomethyl group wherein the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amino nitrogen is substituted with hydrogen or a straight or branched alkyl group of from 1 to 4 carbon atoms, an alkoxycarbonylaminomethyl group wherein the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amino nitrogen is substituted with hydrogen or a straight or branched alkyl group of from 1 to 4 carbon atoms, a p-(alkanoyloxy)benzyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, and an aminoalkanoyloxymethyl group wherein the alkanoyl moiety is straight or branched and has from 2 to 15 carbon atoms and the amino nitrogen is hydrogen, mono- or di-substituted with a straight or branched alkyl group of from 1 to 4 carbon atoms; and non-toxic pharmaceutically acceptable salts and individual optical isomers thereof.

4,229,576

ANTHRANILATES OF OXYALKYLATED CYANURIC ACID

Jürgen Habermeier, Pfeffingen; Roland Moser, Basel, and Wolfgang Seiz, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

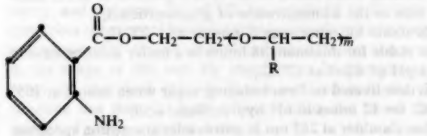
Filed Dec. 4, 1978, Ser. No. 966,426

Claims priority, application Switzerland, Dec. 9, 1977, 15122/77

Int. Cl.[2] C07D *251/34*

U.S. Cl. 544—222 **5 Claims**

1. An anthranilate of the formula I



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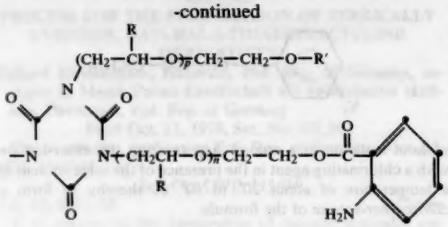


in which each R is hydrogen, methyl or phenyl R' is a hydrogen or anthranoyl and m, n and p are each nought or a number from 1 to 10.

4,229,577

YELLOW PHOTOGRAPHIC COLOR COUPLERS CONTAINING 3-IMINO-1,3,4-THIADIAZOLYL-4 GROUPS

Graham Evans, Chelmsford, England; Mario Fryberg, Praroman-le-Mouret, Switzerland; Thomas Stauner, Marly, Switzerland; Paul Tschopp, Düdingen, Switzerland, and David G. Leppard, Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

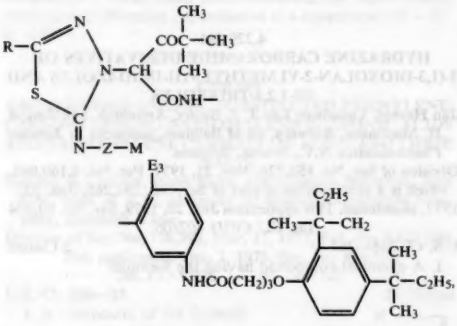
Division of Ser. No. 782,798, Mar. 20, 1977, Pat. No. 4,115,121. This application Apr. 27, 1978, Ser. No. 900,675

Claims priority, application Switzerland, Apr. 14, 1976, 4751/76

Int. Cl.[2] **C07D** *285/12, 401/12, 401/14, 409/04*

U.S. Cl. 548—138 **13 Claims**

1. A yellow coupler which corresponds to the formula



in which E_3 is chlorine or alkyl or alkoxy with 1 to 4 carbon atoms, M is alkyl with 1 to 13 carbon atoms, optionally substituted by halogen, alkoxy with 1 to 5 carbon atoms or phenoxy optionally substituted by alkyl with 1 to 5 carbon atoms; alkoxy with 1 to 5 carbon atoms; benzyl, cyclohexyl or 1-adamantyl, phenyl or phenyl substituted by alkyl or alkoxy with 1 to 5 carbon atoms, halogen, nitro or $-NHCOC_nH_{2n+1}$, in which n is 1 to 5; pyridyl, phenylamino of dialkylamino with, in each case, 1 to 5 carbon atoms in the alkyl part, R is hydrogen, alkyl with 1 to 12 carbon atoms, benzyl, phenyl, thienyl, cyclohexyl or 1-adamantyl, alkoxy with 1 to 5 carbon atoms, alkylmercapto with 1 to 4 carbon atoms, halogen, benzoyl, benzoyloxyalkyl with 1 to 5 carbon atoms in the alkyl part, benzoylamino, mono- or dialkylamino with 1 to 5 carbon atoms in the alkyl part, SO_2NH_2, N,N-dialkylsulphonamide with, in each case, 1 to 5 carbon atoms in the alkyl part, or $-NHCOC_nH_{2n+1}$, in which n is 1 to 5, and Z is —CO— or $-SO_2-$.

4,229,578

PROCESS FOR PREPARING THIOESTERS

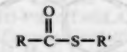
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 29, 1978, Ser. No. 946,983

Int. Cl.[2] **C07D** *277/68;* **C07C** *153/07*

U.S. Cl. 548—165 **7 Claims**

1. A process for the preparation of thioesters having the formula



wherein R represents 2-oxo-3-benzothiazolinylmethyl; phenoxymethyl wherein said phenyl ring is substituted by two chloro radicals; or phenyl substituted by three radicals independently selected from the group consisting of chloro and methoxy; R' represents methyl, ethyl or benzyl as the principal product which consists essentially of reacting in an inert solvent an acid chloride having the formula

with a xanthate having the formula

4,229,579

3-(HALOPYRAZOLYL)-7-TRIAZOLYL-COUMARIN COMPOUNDS

Alfons Dorlars, Leverkusen, and Carl-Wolfgang Schellhammer, Opladen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

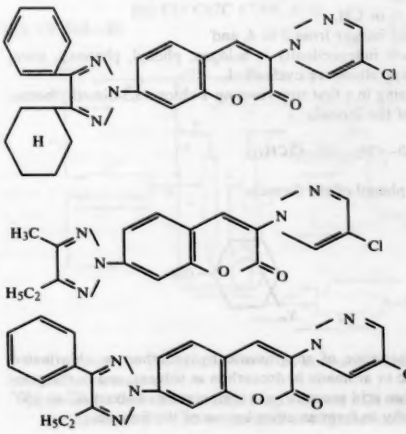
Continuation of Ser. No. 167,859, Jul. 30, 1971, abandoned, which is a continuation of Ser. No. 443,722, Feb. 19, 1974, Pat. No. 4,144,243. This application Apr. 17, 1978, Ser. No. 896,503

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1970, 2037854

Int. Cl.[2] **C07D** *407/14;* **C09K** *1/02*

U.S. Cl. 548—256 **7 Claims**

1. An optical brightener selected from the group consisting of



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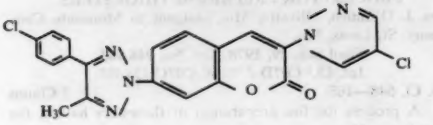
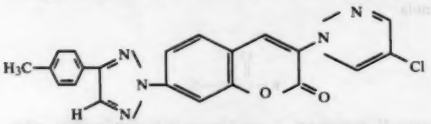
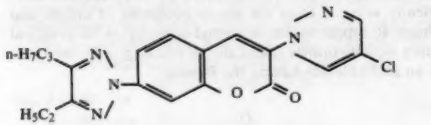




and



4,229,580

PREPARATION OF 1-AZOLYL-3,3-DIMETHYL-1-PHENOXY-BUTAN-2-ONES

Hermann Arold; Hans-Ludwig Elbe; Eckart Kranz; Wolfgang Krämer; Jörg Stetter; Claus Stölzer, and Rudolf Thomas, all of Wuppertal, Fed. Rep. of Gern.any, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

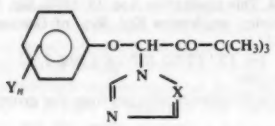
Filed Mar. 9, 1978, Ser. No. 885,053

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713777

Int. Cl.[2] C07D *233/60, 249/08*

U.S. Cl. 548—262 16 Claims

1. A process for the preparation of a 1-azolyl-3,3-dimethyl-1-phenoxy-butan-2-one of the formula



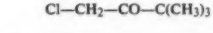
in which

X is N or CH,

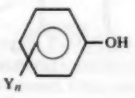
n is an integer from 0 to 4, and

Y each independently is halogen, phenyl, phenoxy, nitro, alkyl, alkoxy or cycloalkyl,

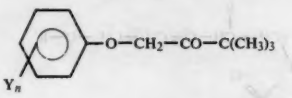
comprising in a first step reacting 1-chloro-3,3-dimethylbutan-2-one of the formula



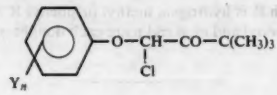
with a phenol of the formula



in the presence of an aromatic hydrocarbon or chlorinated aliphatic or aromatic hydrocarbon as solvent, and in the presence of an acid acceptor, at a temperature of about 60° to 150° C. thereby to form an ether-ketone of the formula



without isolation in a second step reacting the ether-ketone with a chlorinating agent in the presence of the same solvent at a temperature of about 20° to 60° C. thereby to form a chloroether-ketone of the formula



and without isolation in a third step reacting the chloroether-ketone with an azole of the formula

in the presence of the same solvent and in the presence of an acid acceptor at a temperature of about 20° to 120° C.

4,229,581

HYDRAZINE CARBOXAMIDE DERIVATIVES OF 1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

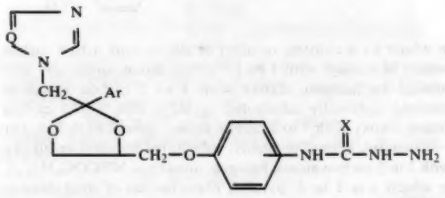
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 853,726, Nov. 21, 1977, Pat. No. 4,160,841, which is a continuation-in-part of Ser. No. 784,265, Jan. 31, 1977, abandoned. This application Jun. 20, 1979, Ser. No. 50,374

Int. Cl.[2] C07D *407/06*

U.S. Cl. 548—262 2 Claims

1. A chemical compound having the formula:



and the stereochemically isomeric forms thereof, wherein:

Q is N;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl being phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

X is a member selected from the group consisting of O and S.

4,229,582

PROCESS FOR THE PREPARATION OF STERICALLY UNIFORM, NATURAL 6-THIATETRACYCLINE DERIVATIVES

Richard Kirchlechner, Hähnlein, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,207

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746044

Int. Cl.[3] C07D *335/04*

U.S. Cl. 549—25 8 Claims

1. A process for the preparation of racemic sterically uniform 6-thiatetracycline derivatives of "natural" configuration which comprises treating a mixture of epimers of corresponding 1,4,4a,5,5a,6,11,12a-octahydro-3,12-dihydroxy-1,11-dioxo-6-thia-naphthacene-2-carboxamides with a saturated heterocyclic amine having a total of 4 to 12 carbon atoms and one ring N atom at a temperature of about 15°–120° C. for a length of time effective to produce said racemic sterically uniform derivatives of "natural" configuration.

4,229,583

PROCESS FOR PREPARING THIO-INDIGO DYESTUFFS

Ernst Spietschka, Idstein, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 655,102, Feb. 4, 1976. This application Nov. 13, 1978, Ser. No. 959,446

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1975, 2504935

Int. Cl.[2] C09B *7/00*

U.S. Cl. 549—52 6 Claims

1. In a process for preparing a thioindigo compound by oxidation of a corresponding 3-hydroxy-thionaphthene or benzothionaphthene with an aqueous alkaline solution of an ammonium or alkali metal peroxo-disulfate, the improvement comprising performing the oxidation at a temperature of −20° to +50° C.

4,229,584

UREYLENEBIS(ANIONIC SUBSTITUTED PHENYLENE CARBONYL)IMINO NAPHTHALENE SULFONIC ACIDS AND NAPHTHALENE CARBOXYLIC ACIDS AND THEIR SALTS

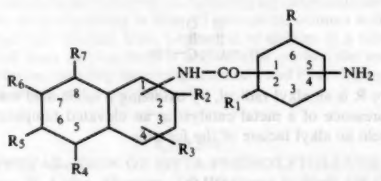
Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 778,398, Mar. 17, 1977, Pat. No. 4,129,590. This application Oct. 2, 1978, Ser. No. 948,178

Int. Cl.[2] C07C *143/60, 143/525*

U.S. Cl. 560—13 29 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of SO_3X and COOY, wherein X is selected from the group consisting of hydrogen and alkali metal and Y is selected from the group consisting of hydrogen, alkali metal and C_1–C_6 alkyl; R_1, R_4, R_5 and R_6 are selected from the group consisting of hydrogen and SO_3X, wherein X is as previously defined; R_2 is selected from the group consisting of hydrogen and acetamido; with the proviso that there is no R_1 or R_2 substituent when the bridgehead carbonylimino is attached at the carbon 2-position of the respective ring; with the further proviso that each naphthalene moiety must contain two or three SO_3X substituents, wherein X is as previously defined; R_3 is selected from the group consisting of hydrogen; SO_3X and COOY, wherein X and Y are as previously defined; and R_7 is selected from the group consisting of hydrogen, hydroxy and SO_3X is as previously defined.

4,229,585

FLUORO-PROSTAGLANDINS

Renato Pellegata, and Carmelo Gandolfi, both of Milan, Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

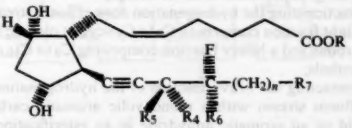
Division of Ser. No. 895,280, Apr. 11, 1978, which is a division of Ser. No. 779,632, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 667,261, Mar. 15, 1976, abandoned. This application Apr. 27, 1979, Ser. No. 34,188

Claims priority, application Italy, Mar. 21, 1975, 21493 A/75

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—55 8 Claims

1. A 16-fluoro prostaglandin analog of the formula:



wherein

R is hydrogen, a C_1–C_{12} alkyl group or a cation of a pharmaceutically acceptable base;

one of R_4 and R_5 is hydroxy and the other is hydrogen; R_6 is a member selected from the group consisting of hydrogen, methyl and fluorine;

n is zero, or an integer of 1 to 6;

R_7 is a member selected from the group consisting of phenyl and phenyl substituted by at least one substituent selected from the group consisting of halogen, C_1–C_6 alkoxy and trihalomethyl.

4,229,586

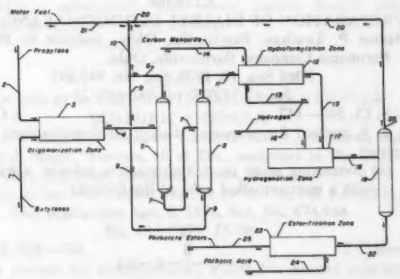
PROCESS FOR PRODUCTION OF MOTOR FUEL AND PHTHALATE ESTERS OR ACYCLIC ALCOHOLS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 2,504, Jan. 10, 1979. This application Jun. 7, 1979, Ser. No. 46,282

Int. Cl.[2] C07C *67/08, 3/16*

U.S. Cl. 560—98 6 Claims



1. A process for the production of an aromatic ester which comprises the steps of:

(a) passing a feed stream comprising a C_3 and a C_4 olefin into an oligomerization zone operated at oligomerization-pro-

moting conditions and effecting the production of an oligomerization zone effluent stream comprising C_6 to C_{10} hydrocarbons including C_7 to C_9 acyclic olefinic hydrocarbons;

(b) fractionating the oligomerization zone effluent stream into a light fraction comprising C_6 hydrocarbons, an intermediate fraction comprising C_7 to C_9 acyclic olefinic hydrocarbons and a heavy fraction comprising C_{10} hydrocarbons;

(c) contacting the intermediate fraction with a hydroformylation catalyst at hydroformylation conditions in admixture with carbon monoxide and hydrogen and effecting the production of a hydroformylation zone effluent stream comprising C_8 to C_{10} acyclic aldehydes, C_8 to C_{10} acyclic alcohols and at least 20 mole percent C_7 to C_9 acyclic olefinic hydrocarbons, with the hydroformylation conditions being effective to result in less than 60 mole percent of any dialkyl olefins and less than 90 mole percent of any trialkyl olefins present in the feed stream from being converted in said hydroformylation zone;

(d) passing the entire hydroformylation zone effluent stream through a hydrogenation zone operated at aldehyde hydrogenation conditions and effecting the formation of a hydrogenation zone effluent stream;

(e) fractionating the hydrogenation zone effluent stream into a light fraction comprising C_7 to C_9 acyclic olefinic hydrocarbons and a heavy fraction comprising C_8 to C_{10} acyclic alcohols;

(f) contacting the heavy fraction of the hydrogenation zone effluent stream with a monocyclic aromatic carboxylic acid or an aromatic anhydride in an esterification zone maintained at esterification-promoting conditions and effecting the production of an esterification zone effluent stream comprising an aromatic ester; and,

(g) recovering the aromatic ester from the esterification zone effluent stream.

4,229,587

PROCESS FOR PREPARING AROMATIC ESTERS

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,498

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—131 **8 Claims**

1. A process for the preparation of esters which comprises reacting benzene or an aryl alkyl compound wherein the alkyl group is about C_1 to C_4 with a C_2 to C_8 carboxylic acid and oxygen in the vapor phase at an elevated temperature in the presence of a catalytically effective amount of a catalyst consisting essentially of an oxide of uranium and at least one oxide selected from the group consisting of arsenic, antimony and bismuth oxides.

4,229,588

PREPARATION OF DIALKYL DITHIODIALKANOATES

Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

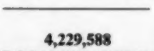
Filed Sep. 19, 1978, Ser. No. 943,892

Int. Cl.[2] C07C *148/00, 149/20*

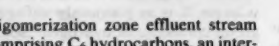
U.S. Cl. 560—147 **6 Claims**

1. A method for preparing dialkyl dithiodialkanoate comprising:

(a) contacting in an inert hydrocarbon solvent, a halogen with a mercaptoalkyl ester of the formula



wherein R is an alkylene radical having from 1 to 12 carbon atoms and R′ is an alkyl radical having from 1 to 12 carbon atoms, the mole ratio of halogen to mercaptoalkyl ester being between 0.4:1 to 0.6:1, to produce (1) a first liquid phase of dialkyl dithiodialkanoate having the formula



and (2) a separate, second liquid phase of hydrocarbon solvent, and

(b) separating liquid phases thereby obtaining (1) dialkyl dithiodialkanoate and (2) hydrocarbon solvent.

4,229,589

PROCESS FOR PREPARING A DIESTER OF OXALIC ACID

Kenji Nishimura; Shinichiro Uchiumi; Kozo Fujii; Keigo Nishihira; Masayoshi Yamashita, all of Ube, and Hiroshi Itatani, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Aug. 31, 1978, Ser. No. 938,343

Claims priority, application Japan, Sep. 7, 1977, 52/106790

Int. Cl.[3] C07C *67/36, 69/36*

U.S. Cl. 560—193 **6 Claims**

1. A process for preparing a diester of oxalic acid which comprises contacting carbon monoxide with an ester of nitrous acid in the liquid phase in the presence of metallic palladium or a salt thereof under a partial pressure of carbon monoxide of 5 to 200 atm. at a temperature of 20° to 150° C., said ester of nitrous acid being an ester of nitrous acid with an alcohol having 1 to 20 carbon atoms selected from the group consisting of a saturated monohydric aliphatic alcohol, a saturated dihydric aliphatic alcohol, an alicyclic alcohol and an aralkyl alcohol, to produce said diester of oxalic acid containing the same ester group as that of said ester of nitrous acid.

4,229,590

PREPARATION OF ALKYL PYRUVATES

Christian Dudeck, Limburgerhof; Gunter Lehmann, Ludwigshafen; Bernd Meissner, Heidelberg; Hans Diem, Mannheim; Werner Fliege, Otterstadt; Norbert Petri, Frankenthal, and Karl-Heinz Ross, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

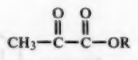
Filed Feb. 8, 1979, Ser. No. 10,725

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809421

Int. Cl.[2] C07C *67/30, 67/42, 69/67*

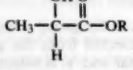
U.S. Cl. 560—174 **11 Claims**

1. A process for the preparation of an alkyl pyruvate of the formula



I

where R is an alkyl radical, by oxidizing a lactic acid ester in the presence of a metal catalyst at an elevated temperature, wherein an alkyl lactate of the formula



II

where R has the above meaning, is reacted with free oxygen in the presence of a catalyst of silver crystals having a particle size of from 0.01 micrometer to 2.5 millimeters, at from 450° to 700° C.

4,229,591

PROCESS FOR PREPARING A DIESTER OF OXALIC ACID IN THE GASEOUS PHASE

Kenji Nishimura; Kozo Fujii; Keigo Nishihira; Masaoki Matsuda, and Shinichiro Uchiumi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Aug. 31, 1978, Ser. No. 938,358
Claims priority, application Japan, Jan. 25, 1978, 53-6150
Int. Cl.[3] C07C *67/36, 69/36*
U.S. Cl. 560—193 3 Claims

1. A process for preparing a diester of oxalic acid which comprises contacting an ester of nitrous acid with carbon monoxide in the gaseous phase under ambient or reduced pressure in the presence of a solid catalyst containing metallic palladium or a salt thereof at a temperature of 50° to 200° C., and ester of nitrous acid being an ester of nitrous acid with an alcohol having 1 to 8 carbon atoms selected from the group consisting of a saturated monohydric alphatic alcohol and an alicyclic alcohol, to produce the diester of oxalic acid containing the same ester group as that of said ester of nitrous acid.

4,229,592

INTERMEDIATE FOR PROSTAGLANDINS AND PROCESS FOR PREPARING THE INTERMEDIATE

Lester A. Mitscher; George W. Clark, III, and Paul B. Hudson, all of Lawrence, Kans., assignors to Kansas University Endowment Association, Lawrence, Kans.

Filed Feb. 6, 1978, Ser. No. 875,064
Int. Cl.[2] C07C *67/08, 67/28, 69/145*
U.S. Cl. 560—231 4 Claims

1. 4α-acetoxy-2-cyclopentenone-3-carboxyaldehyde.

2. The method of preparing 4α-acetoxy-2-cyclopentenone-3-carboxyaldehyde consisting essentially in acetylating terrein in the 5-position with acetic anhydride and sodium acetate at a temperature below 65° C., removing the acetoxy group of the formed 5-acetylterrein with chromous chloride, acetylating the formed 5-deoxyterrein with acetic anhydride and sodium acetate and cleaving the side chain of the formed 5-deoxy-4α-acetylterrein through oxidation of the side-chain double bond to said aldehyde in the named stereoconfiguration.

4,229,593

METHOD TO PREPARE (+)-CIS-3-(2,2-DICHLOROETHENYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLIC ACID

Kiyoshi Kondo, Kanagawa, and Minoru Suda, Sagami Hara, both of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed May 29, 1979, Ser. No. 43,599
Int. Cl.[3] C07C *61/40*
U.S. Cl. 562—401 4 Claims

1. A method to prepare 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylic acid containing at least 50% (+)-cis isomer which comprises neutralizing racemic cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylic acid containing at least 40 percent cis isomers with an alkaloid base selected from l-ephedrin or quinine in a solvent selected from ethyl acetate or acetonitrile, cooling the resulting solution, isolating the precipitated salt, and hydrolyzing the salt to produce the enriched acid.

4,229,594

PREPARATION OF META-PHENOXYTOLUENE

Thomas H. Colby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 891,951, Mar. 31, 1978, abandoned. This application May 14, 1979, Ser. No. 38,601
Int. Cl.[3] C07C *41/01*
U.S. Cl. 568—635 3 Claims

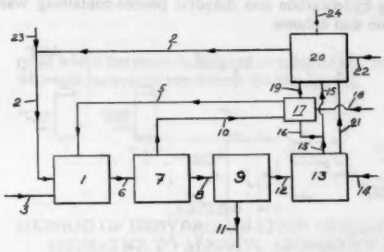
1. A process for preparing meta-phenoxytoluene which comprises treating a mixture of sodium and potassium meta-cresylates containing at least fifty mole percent of potassium meta-cresylate, with from 1.1 to about 1.5 moles of chlorobenzene per mole of said cresylates, under essentially anhydrous conditions, in the presence of from about 0.5 to about 0.9 mole of meta-cresol and from about 0.01 to about 0.035 mole of cuprous chloride per mole of said cresylates, at a temperature within the range of from about 150° C. to about 170° C.

4,229,595

METHOD OF PRODUCING NITRO-PHENOLS

Erik Bengtsson, and Boris Holm, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Sep. 25, 1978, Ser. No. 945,367
Claims priority, application Sweden, Oct. 7, 1977, 7712088
Int. Cl.[2] C07C *79/26*
U.S. Cl. 568—706 22 Claims



1. A method of producing mono-nitro compounds of monohydric phenol and alkyl substituted derivatives of monohydric phenol which comprises nitrosating said phenol or alkyl substituted derivative of phenol in a nitric acid solution through treatment with nitrogen oxides at temperatures of between +10° and −30° C.;

oxidizing the nitroso compound at a temperature of between 20° and 45° C. after an increase of the temperature of the nitric acid;

separating off nitrogen oxides during said oxidizing;

separating the nitro compound from the reaction mixture through cooling and filtering;

subjecting the mother liquor and washing liquids to destructive oxidation with nitric acid at a temperature exceeding 130° C. and an increased pressure so that the mother liquor and washing liquids after emitting at least nitrogen oxides and carbon dioxide will substantially contain only nitric acid and water;

and returning the nitric acid and nitrogen oxides from both the oxidation stage and the destruction stage and using them for new nitrosation and destruction, whereby from the reaction system, is formed said nitro compounds and in addition, substantially only water, carbon dioxide and possibly nitrogen will be emitted.

4,229,596

PROCESS FOR THE CONTINUOUS ISOLATION OF DIHYDRIC PHENOLS

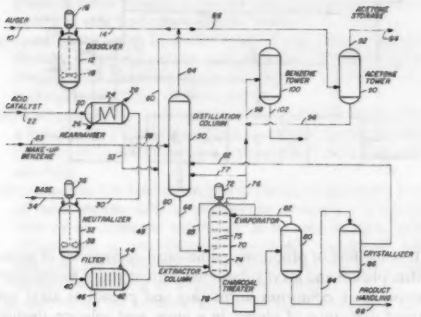
Ward J. Burkholder, Houston; Glenn E. Miller, Pasadena, and Fritz J. Nagel, Houston, all of Tex., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 16,658, Mar. 5, 1970, Pat. No. 3,968,171. This application Apr. 8, 1976, Ser. No. 674,964
Int. Cl.[2] C07C *37/08*
U.S. Cl. 568—768 2 Claims

1. A process for manufacturing a dihydric phenol selected from the class consisting of hydroquinone and resorcinol comprising the combined steps of:

(a) dissolving a dialkylbene dihydroperoxide selected from the class consisting of para and meta dialkylbenzene dihydroperoxides in a ketone solvent;

(b) introducing an acid catalyst for rearranging said dihydroperoxide into a ketone solvent;
(c) rearranging and decomposing the dihydroperoxide by acid catalysis to form said dihydric phenol product and said ketone by-product, the ketone solvent being selected to be the same ketone as is produced as a by-product of the hydroperoxide rearrangement and decomposition reaction;
(d) introducing the liquid rearrangement effluent and a hydrocarbon into a distillation column;
(e) introducing an aqueous feed into said column, said aqueous feed introduced into said column being sufficient to dissolve all of said dihydric phenol present in said column;
(f) removing the ketone as overhead from said column;
(g) removing a bottoms phase comprising impurity-containing hydrocarbon and dihydric phenol-containing water from said column;



(h) feeding said bottoms phase to an extractor vessel;
(i) adding water to said extractor vessel near the top thereof;
(j) adding a stream of said hydrocarbon to said vessel near the bottom thereof;
(k) intimately intermixing said product with said water and said hydrocarbon countercurrently in said extractor vessel;
(l) recovering from said extractor vessel, a hydrocarbon phase containing substantially all of said by-products and said impurities and substantially none of said dihydric phenol;
(m) recovering as bottoms from said extractor vessel an aqueous phase containing said phenol substantially free of said by-products or impurities; and
(n) recovering said dihydric phenol from said aqueous phase by crystallization.

4,229,597

PROCESS FOR THE PREPARATION OF RESORCIN

Thoru Taguchi, Waki; Tokinori Ago, Ohtake, and Isao Hashimoto, Waki, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Oct. 3, 1978, Ser. No. 948,630
Claims priority, application Japan, Oct. 8, 1977, 52-120507
Int. Cl.[2] C07C *37/08, 39/08*
U.S. Cl. 568—768 **6 Claims**

1. In a process for the preparation of resorcin by decomposing meta-diisopropylbenzene dihydroperoxide in the presence of a synthetic silica-alumina catalyst, the improvement comprising feeding said meta-diisopropylbenzene dihydroperoxide and water under agitation into a reaction vessel filled with a dispersion of said synthetic silica-alumina catalyst in a mixed solvent comprising a major amount of acetone and a minor amount of an aromatic hydrocarbon, and decomposing said meta-diisopropylbenzene dihydroperoxide under reflux conditions in the presence of 0.4 to 0.9% by weight of water based on the total starting mixture.

4,229,598

CHEMICALS FOR TREATMENT OF PVC

Dean R. Weimer, and Charles M. Starks, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Dec. 14, 1978, Ser. No. 969,742
Int. Cl.[3] C07C *39/06*
U.S. Cl. 568—792 **1 Claim**

1. A free radical inhibitor for terminating polyvinyl chloride polymerizations, said inhibitor prepared by a process comprising
(1) methylating phenol with methanol in vapor phase at pressures of from about 110 to about 200 pounds per square inch gauge, temperatures of from about 400° C. to about 700° C. and a liquid hourly space velocity of from about 1 to about 15 and recovering a product stream therefrom;
(2) distilling said product stream into desired fractions and retaining the fraction obtained at temperatures of from about 205° C. to about 230° C. at one atmosphere, and then;
(3) alkylating the retained fraction with an alkylating agent selected from the group consisting of isobutylene, isopentylene, isohexene, isooctene, cyclohexene or cyclopentene in the presence of a catalyst selected from the group consisting of sulfuric acid, sulfonic acids, sulfonated polystyrene resins crosslinked with divinylbenzene, and boron trichloride etherates at temperatures of from about 10° C. to about 110° C. and pressures of at least atmospheric while at a product fraction/alkylating agent weight ratio of from about 1/0.23 to about 1/1.85 respectively, then;
(4) fractionally distilling the product of (3) and retaining the fraction obtained at temperatures of from about 110° C. to about 200° C. at 30 mm of mercury.

4,229,599

PREPARATION OF A CARYOPHYLLENE ALCOHOL MIXTURE

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,186
Int. Cl.[3] C07C *29/15, 35/23*
U.S. Cl. 568—819 **5 Claims**

1. The process for rearranging a caryophyllene derivative selected from the group consisting of caryophyllene oxide and dihydro caryophyllene oxide using an aluminum isopropylate catalyst and a toluene solvent comprising the steps of (i) intimately admixing aluminum isopropylate, toluene and the caryophyllene derivative to form a mixture; (ii) heating the resulting mixture at a temperature of from 100° C. up to 150° C. for a period of time of from about 1 up to about 5 hours; and (iii) recovering the rearranged caryophyllene oxide or dihydro caryophyllene oxide, a mixture of alcohols, from the reaction mass; the concentration of aluminum isopropylate catalyst in the reaction mass varying from about 0.025 molar up to about 0.75 molar; and the concentration of caryophyllene oxide or dihydro caryophyllene oxide in the reaction mass varying from about 0.25 molar up to about 1.00 molar.

4,229,600

NORBORNANE AND NORBORNENE DERIVATIVES

Toyohiko Kobayashi; Haruki Tsuruta, and Toshio Yoshida, all of Yokohama, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

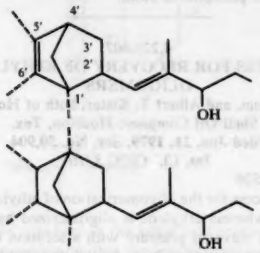
Filed Jul. 28, 1978, Ser. No. 929,055

Claims priority, application Japan, Jul. 28, 1977, 52/90846; Nov. 14, 1977, 52/136547

Int. Cl.[3] C07C *31/13, 33/05*

U.S. Cl. 568—820 3 Claims

1. A norbornane or norbornene compound of the formulae:



wherein one methyl group is present at one of the 1', 4', 5' or 6' positions of the nucleus of said compound.

4,229,601

CONVERTING ETHYLENE AND PROPYLENE TO THE GLYCOL USING T.BUTYL HYDROPEROXIDE IN A TWO-PHASE LIQUID REACTANT

Ching-Yong Wu, O'Hara Township, Allegheny County, and Thaddeus P. Kobylinski, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 972,949

Int. Cl.[3] C07C *31/20*

U.S. Cl. 568—860 11 Claims

1. A method of preparing ethylene or propylene glycol in high yield which comprises contacting t.butyl hydroperoxide with ethylene or propylene at an elevated pressure in a heterogeneous two-phase liquid reaction system comprising an organic polar solvent, a catalytic quantity of osmium tetroxide, about 0.1 to about ten weight percent cesium hydroxide, rubidium hydroxide or potassium hydroxide and about one to about 40 weight percent water at a moderate temperature and at a pH of about 14.

4,229,602

DEHYDROCYCLIZATION PROCESS

Francis M. Brinkmeyer, and Donald M. Haskell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1978, Ser. No. 966,457

Int. Cl.[2] C07C *5/36;* C10G *35/04*

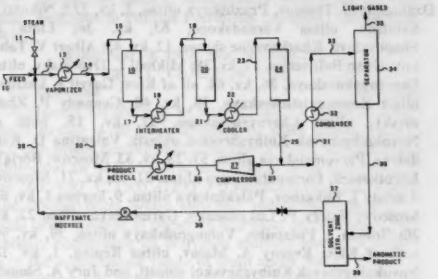
U.S. Cl. 585—407 8 Claims

1. A process for producing aromatics from aliphatic hydrocarbons which comprises the steps of

(a) contacting a feed comprising aliphatic hydrocarbons with steam and a dehydrocyclization catalyst under steam-active dehydrocyclization conditions sufficient to form a vapor stream comprising aromatics, nonaromatics, and hydrogen,

(b) separating at least a portion of said vapor stream and increasing the pressure thereof by compressing same and then heating the compressed vapor to approximately the dehydrocyclization temperature and pressure, and

(c) recycling said compressed and heated vapor stream to the dehydrocyclization reaction in step (a) at a gradually increased rate such that the amount of steam diluent used in (a) is gradually reduced after startup of the process to a



point where the steam is replaced or substantially replaced with said recycle as the diluent for the process.

4,229,603

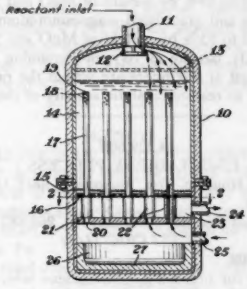
METHOD OF DEHYDROGENATION OF ALKYL AROMATICS TO ALKENYL AROMATICS

George W. Lyon, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 406,443, Oct. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 202,375, Nov. 26, 1971, Pat. No. 3,787,188. This application Apr. 26, 1977, Ser. No. 791,073

Int. Cl.[2] C07C *5/38*

U.S. Cl. 585—444 5 Claims



1. A method for dehydrogenating an alkylbenzene compound having from 1 to 3 alkyl groups attached to a benzene nucleus of which 1 to 2 alkyl groups contain 2–3 C atoms comprising feeding said alkylbenzene compound at a temperature of 450°–500° C. through the inlet port of a reactor, feeding stream at a temperature of 650° to about 1000° C. into the interior of a fixed bed of dehydrogenation catalyst, said stream flowing in a countercurrent manner to said flow of alkylbenzenes in heat exchange relationship in said bed prior to introduction into said bed, said point of introduction being just below the point of introduction of the alkylbenzene compound into said bed, said steam being supplied in sufficient quantity to maintain the mixture, at a temperature of about 575° to 675° C. upon mixing the alkybenzene and steam in said catalyst bed, passing the mixture through said catalyst bed and withdrawing reacted effluent from the reactor, the total steam to hydrocarbon ratio weight to weight basis, being less than about 3 to 1, to about 0.7 to 1 each respectively.

4,229,604
PROCESS FOR PRODUCING UNSATURATED HYDROCARBONS

Dzantemir N. Tmenov, Prazhskaya ulitsa, 3, kv. 222; Nikolai I. Svintsov, ulitsa Vernadskogo, 63, kv. 38; Lidia P. Shapovalova, Kharkovskoe shosse, 12, kv. 43; Albert V. Tabakov, ulitsa Boichenko, 17, kv. 38; Mikhail L. Dvoretsky, ulitsa Bereznyakovskaya, 26, kv. 64, all of Kiev; Gavril I. Vasiliev, ulitsa Kommunisticheskaya, 38, kv. 40; Gennady P. Zhestovsky, ulitsa Chernyshevskogo, 27, kv. 15, both of Novokuibyshevsk Kuibyshevskoi oblasti; Valentina D. Kandalova, Pervomaiskaya ulitsa, 51/23, kv. 33, Moscow; Boris S. Korotkevich, Fortunatovskaya ulitsa, 31/35, kv. 71, Moscow; Anatoly I. Lukashov, Palekhskaya ulitsa, 9, korpus 1, kv. 65, Moscow; Valery P. Lukyanenko, Garmotnaya ulitsa, 22, kv. 20; Roman I. Polataiko, Volgogradskaya ulitsa, 39, kv. 96, both of Kiev; Evgeny A. Malov, ulitsa Repina, 1, kv. 18, Novokuibyshevsk Kuibyshevskoi oblasti, and Jury A. Shmuk, Leninsky prospekt, 13, kv. 3, Moscow, all of U.S.S.R.

Filed Feb. 5, 1979, Ser. No. 9,522
Int. Cl.[2] C07C *15/10*; B01J *23/84, 29/16*
U.S. Cl. 585—445 **9 Claims**

1. A process for producing unsaturated hydrocarbons comprising contacting compounds selected from the group consisting of paraffin, monoolefin and alkylaromatic hydrocarbons at a temperature within the range of from 400° to 700° C. in the presence of an inert component selected from the group consisting of an inert gas and steam, and in the presence of oxygen in an amount up to 0.1 mole per mole of the hydrocarbon feed, with a catalyst consisting essentially of oxides selected from the group consisting of cobalt, nickel, iron and manganese deposited on a carrier in an amount of from 3.7 to 15% by weight of the catalyst; said catalyst also including an oxide of molybdenum in an amount of from 5 to 35% by weight of the catalyst, also deposited on the carrier; said carrier being selected from the group consisting of granulated porous crystalline silica modified with magnesia in an amount of 1 to 20% by weight of the carrier, granulated magnesium-titanium oxides consisting of 50 to 95% by weight of MgO and 50 to 5% by weight of TiO_2 and granulated magnesium-aluminum oxides consisting of 70 to 95% by weight of MgO and 5 to 30% by weight of Al_2O_3; passing an oxygen-containing gas through the spent catalyst at a temperature within the range of from 400° to 700° C. to restore catalytic activity of the catalyst.

4,229,605
1,7-OCTADIENE PROCESS

Kenzie Nozaki, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 13, 1978, Ser. No. 968,882
Int. Cl.[2] C07C *11/12*
U.S. Cl. 585—509 **9 Claims**

1. A process for preparing 1,7-octadiene which comprises hydrodimerizing butadiene in the presence of formic acid or a salt of formic acid, optionally a solvent, a catalytic amount of palladium and a tertiary organophosphorus ligand having the formula:

$$(RO)_aPR_b$$

wherein R is aryl, alkyl, aralkyl or alkaryl with less than about 20 carbon atoms where the Rs attached to the phosphorus and oxygen atoms are the same or different, O is oxygen, a+b equals 3 and b is 1 or 2.

4,229,606
1,7-OCTADIENE PROCESS

Kenzie Nozaki, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 13, 1978, Ser. No. 968,883
Int. Cl.[2] C07C *11/12*
U.S. Cl. 585—509 **8 Claims**

1. A process for preparing 1,7-octadiene which comprises hydrodimerizing butadiene in the presence of formic acid or a salt thereof, optionally a solvent, a catalytic amount of palladium and a mixture of tertiary organo phosphorus ligands comprising a first ligand having the formula $(RO)_aPR_b$ and a second ligand having the formula $(RO)_{a'}PR_{b'}$ wherein a+b equal 3, a is 0, 1 or 2, a'+b' equal 3, a' is 0, 1, 2 or 3, a is not the same as a', R is aryl, alkyl, aralkyl or alkaryl with less than about 20 carbon atoms wherein the Rs attached to the phosphorus and oxygen are the same or different and with at least one R of said first ligand being a sterically hindering moiety selected from benzyl or branched alkyl, aralkyl, alkenyl and cycloalkyl having from 3 to about 10 carbon atoms wih branching occuring at a carbon atom no more than two carbon atoms from the phosphorus atom.

4,229,607
PROCESS FOR RECOVERY OF ETHYLENE OLIGOMERS

Clarence R. Gum, and Albert T. Kister, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 21, 1979, Ser. No. 50,904
Int. Cl.[2] C07C *3/10*
U.S. Cl. 585—520 **8 Claims**

1. In the process for the oligomerization of ethylene to linear alpha-olefins wherein ethylene is oligomerized by contact in liquid phase at elevated pressure with a solution of an oligomerization catalyst composition comprising catalytically active nickel complex in an aliphatic diol solvent to afford a reaction product made up of (1) a liquid solvent phase containing dissolved catalyst, (2) a liquid hydrocarbon phase comprising ethylene oligomers containing dissolved ethylene, catalyst, diol solvent and a minor amount of diol solvent decomposition products and (3) a gaseous ethylene phase, said ethylene oligomers being recovered by separating the liquid hydrocarbon phase from the gaseous ethylene and at least part of the liquid solvent phase under pressure after which the separated liquid hydrocarbon phase is sequentially washed with sufficient aliphatic diol solvent to remove any residual amount of active catalyst, subject to reduced pressure to flash off dissolved ethylene and scrubbed with water to remove residual solvent; the improvement which comprises, contacting the liquid hydrocarbon phase, immediately after water scrubbing, with sufficient aqueous acid at elevated temperature to hydrolyze and extract the diol solvent decomposition products, said aqueous acid having a pH below about 5, and recovering therefrom a liquid hydrocarbon phase substantially free of diol solvent decomposition products.

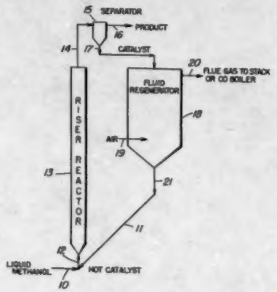
4,229,608
HEAT BALANCED CYCLIC PROCESS FOR MANUFACTURE OF LIGHT OLEFINS

Nai Y. Chen, Titusville; Werner O. Haag, Lawrenceville, both of N.J., and Rudolph M. Lago, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,718
Int. Cl.[3] C07C *1/00*
U.S. Cl. 585—640 **10 Claims**

1. A heat balanced cyclic process for converting a charge consisting essentially of methanol, dimethyl ether or mixtures thereof to a hydrocarbon product rich in ethylene and propylene which comprises contacting said charge with a fluidized catalyst comprising a crystalline aluminosilicate zeolite characterized by pores, the major dimension of which is less than 6 Angstroms, further characterized by pore windows of about a size such as would be provided by 8-membered rings of oxygen atoms and the capability, under the hereinafter specified conditions, of producing less than 20 weight percent methane in said hydrocarbon product, said contacting taking place in a riser reactor at an inlet temperature between about 800 and 1000° F. and an increased outlet temperature between about 900° and about 1150° F. with a weight ratio of catalyst to charge between about 5 and about 12 and a residence time between

catalyst and charge of less than 30 seconds, during which time, a minor proportion of less than about 9 percent by weight of the charge is converted to form a carbonaceous deposit on said catalyst in an amount of between about 0.4 and about 1 weight percent, thereafter separating the hydrocarbon product, rich in ethylene and propylene from the carbonaceous deposit-containing catalyst, conducting the latter to a regenerator, maintained at a temperature within the approximate range of 1200° to 1400° F., wherein said carbonaceous deposit is removed by combustion in air, recycling the resulting hot regenerated catalyst to further contact with a fresh stream of said charge and repeating the above cycle.



4,229,609
PROCESS FOR DEHYDROGENATING HYDROCARBONS

Thomas Hutson, Jr., and Francis M. Brinkmeyer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 8, 1979, Ser. No. 18,689
Int. Cl.² C07C *5/36*
U.S. Cl. 585—660 **15 Claims**

1. A process for dehydrogenating a dehydrogenatable hydrocarbon feed using a bed of steam active dehydrogenation catalyst and repetitively regenerating said catalyst with steam and oxygen-containing gas wherein the flow rate of steam through the catalyst bed is maintained constant comprising,

passing dehydrogenatable hydrocarbon feed through the catalyst bed under dehydrogenation conditions for a predetermined period of time,

then stopping the flow of dehydrogenatable hydrocarbon to the catalyst bed,

then after the steam has purged at least part of the dehydrogenatable hydrocarbon from the catalyst bed passing oxygen-containing gas through the catalyst bed under regeneration conditions for a period of time,

then stopping the flow of oxygen-containing gas to the catalyst bed,

then after the steam has purged at least part of the oxygen from the catalyst bed passing dehydrogenatable hydrocarbon through the catalyst bed under dehydrogenation conditions wherein more than one catalyst bed is employed and wherein dehydrogenation is conducted in one catalyst bed while regeneration is conducted in another and wherein the dehydrogenated hydrocarbon that is supplied to each catalyst bed is preheated by being passed in indirect heat exchange with the effluent from a catalyst bed that is being regenerated.

4,229,610
OLEFIN DOUBLE BOND ISOMERIZATION

John W. Myers, and Dean P. Montgomery, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 3, 1978, Ser. No. 957,607
Int. Cl.² C07C *5/24, 5/30*
U.S. Cl. 585—664 **5 Claims**

1. A process for shifting an internal double bond of a monoolefin having 4–20 carbon atoms to yield terminal olefin which comprises heating said monoolefin under isomerization conditions at an isomerization temperature in the approximate range 260°–650° C. (500°–1200° F.) sufficient to cause shifting of the double bond while avoiding substantial cracking or skeletal isomerization in presence of a catalyst or contact mass essentially comprising an activated alumina having a surface area in the approximate range of from about 300 to about 400 square meters per gram and containing sodium oxide in the approximate range 0.13–0.39 milliequivalents of Na_2O per gram of catalyst, and silica in the approximate range 0.5–6.3 weight percent of the catalyst, the sodium oxide having been supplied in the catalyst composition using a compound of sodium which on calcination yields the oxide.

4,229,611
ISOMERIZATION ALKYLATION SYSTEMS

George M. Kramer, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 889,033, Mar. 22, 1978, Pat. No. 4,162,233.
This application Apr. 11, 1979, Ser. No. 28,989
Int. Cl.² C07C *3/52*
U.S. Cl. 585—728 **13 Claims**

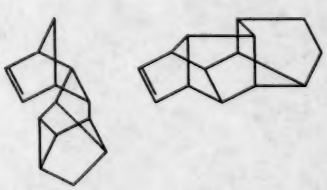
1. A hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock in the presence of a catalyst composition comprising a Lewis acid characterized as having a "Selectivity Parameter" $(I/E)_{MCP}$ greater than about 0.5, a non-reactive aprotic solvent selected from the group consisting of halogenated C_1–C_3 alkanes, halogenated cyclopropane, halogenated C_2–C_3 alkenes, wherein the C_2 and C_3 compounds contain at least 2 halogen atoms per mole of compound and an alkyl halide at a temperature ranging from about −100° C. to about 50° C. and forming a reaction product.

4,229,612
DECOLORIZATION OF NORBORNADIENE DIMERS

Lewis W. Hall, Jr., Chadds Ford, Pa.; David L. Kerr; Elmer J. Hollstein, both of Wilmington, Del.; Harry K. Myers, Jr., Aston Township, Chester County, and Abraham Schneider, Overbrook Hills, both of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Jan. 29, 1979, Ser. No. 7,112
Int. Cl.² C07C *13/28*
U.S. Cl. 585—823 **13 Claims**

1. Process for the decolorization of an olefinic hexacyclic dimer of norbornadiene comprising contacting a dimer selected from a group consisting of isomers having the following structures or a mixture thereof:



with a natural or synthetic serpentine clay and continuing the contacting until decolorization occurs.

4,229,[illegible]

OLEFIN DOUBLE BOND ISOMERIZATION

John W. Myers, and Dean P. Montgomery, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 6, 1978, Ser. No. [illegible]
Int. Cl.[illegible] C07C 5/[illegible]
U.S. Cl. 585—[illegible] [illegible] Claims

1. A process for shifting the internal double bond of a monoolefin having 4-20 carbon atoms, of your aromatic nature which comprises having said monoolefin into [illegible] contacting at an isomerization temperature in the range of [illegible] about 120°-450° C. (900°-1200° F.) sufficient to cause shifting of the double bond while avoiding substantial skeletal rearrangement, in presence of a catalyst composition consisting essentially of [illegible] alumina [illegible] step in the [illegible] range [illegible] [illegible] [illegible] specific surface area [illegible] grams [illegible] the [illegible] range [illegible] grams [illegible] of catalyst, and [illegible] weight range [illegible] weight percent of the [illegible] the [illegible] having been [illegible] to the catalyst composition using a [illegible] in [illegible] its presence in the [illegible].

4,229,[illegible]

PETROLEUM [illegible] SYSTEMS

George W. Kramer, [illegible], assignor to [illegible] Research & Engineering Co., [illegible] N.J.

Division of Ser. No. [illegible], Nov. 22, 1976, Pat. No. 4,[illegible]. This application Apr. 11, 1978, Ser. No. [illegible]
Int. Cl.[illegible] C10G [illegible]
U.S. Cl. 585—[illegible] [illegible] Claims

1. A hydrocarbon [illegible] process which comprises [illegible] a hydrocarbon [illegible] in the presence of [illegible] comprising a [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] consisting of [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] °C. [illegible] 300° C. [illegible].

4,229,[illegible]

[illegible] NITROGEN-[illegible] COMPOUNDS

Lewis W. Hall, Jr., [illegible]; [illegible], Pa.; [illegible] of Wilmington, Del.; [illegible], assignors to [illegible], Philadelphia, Pa.

Filed Jan. 29, 1979, Ser. No. 7,[illegible]
Int. Cl.[illegible] C07C [illegible]
U.S. Cl. 585—[illegible] [illegible] Claims

1. A process for the [illegible] of [illegible] nitrogen-containing compounds [illegible] group [illegible] the following structures or a [illegible] thereof:

[illegible] and charging [illegible] than [illegible] during which time, a minor proportion of less than about [illegible] percent by weight of [illegible] forms carbonaceous deposit on said catalyst in an amount of between about 0.[illegible] and about [illegible] weight percent, thereafter separating the hydrocarbon product rich in ethylene and propylene from the carbonaceous deposit-containing catalyst, contacting the latter in a regeneration zone [illegible] at a temperature within the [illegible] range of [illegible] [illegible] and carbonaceous deposit is removed by combustion [illegible] the [illegible] [illegible] [illegible] to [illegible] with a fresh stream of said [illegible] and repeating the above cycle.

4,229,[illegible]

PROCESS FOR [illegible] HYDROCARBONS

[illegible], Jr., and [illegible], both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 8, 1979, Ser. No. [illegible]
Int. Cl.[illegible] C10G [illegible]
U.S. Cl. 585—[illegible] [illegible] Claims

1. A process for [illegible] a [illegible] [illegible] using a bed of [illegible] which comprises repeatedly regenerating said catalyst bed [illegible] oxygen-containing gas wherein the flow rate of [illegible] through the catalyst bed is maintained constant, comprising:

passing [illegible] hydrocarbon [illegible] through the catalyst bed under [illegible] conditions for a [illegible] period of time;

then stopping the flow of [illegible] through the catalyst bed;

then after the [illegible] has [illegible] at least part of the [illegible] from the catalyst bed [illegible] oxygen-containing gas through the catalyst bed under regeneration conditions for a period of time;

then stopping the flow of oxygen-containing gas to the catalyst bed;

then after the system has purged at least part of the oxygen from the catalyst bed passing [illegible] hydrocarbon through the catalyst bed under [illegible] conditions wherein [illegible] of [illegible] a [illegible] and [illegible] is [illegible] and [illegible] the [illegible] that [illegible] supplied to [illegible] by [illegible] in [illegible] with [illegible] and [illegible] a [illegible].

4,229,613

MONO-HOSE WITH ELECTRICAL CONDUCTORS AND END CONNECTOR MEANS

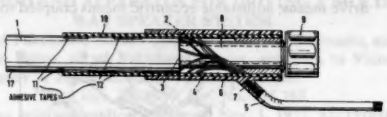
Siegfried V. Braun, Eschborn, Fed. Rep. of Germany, assignor to Gummi-Roller GmbH & Co., Eschborn, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,727

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719851

Int. Cl.[3] F16L *11/12*

U.S. Cl. 174—47 11 Claims



1. A flexible pressure hose comprising:

a hose member of a flexible material for conveying a pressurized medium;

an outer layer of flexible material surrounding said hose member;

a plurality of electrically conductive, stranded metal wires separately embedded in the outer layer of flexible material and extending substantially the length of the hose member, said stranded metal wires extending out of said outer layer at an end area thereof;

a connector means attached to at least one end of the hose member comprising a first protective cover circumferentially surrounding the hose member in said end area where the stranded metal wires extend out of the outer layer and providing an area for the attachment of the hose member to a passageway for pressurized medium, a second protective cover integral with said first protective cover circumferentially surrounding the stranded metal wires and providing an area for attachment of the stranded metal wires to a means for conducting electric current, a metal connector fitting attached to the end of the hose member and a shrunk-on sleeve within the first protective cover and substantially surrounding the hose member and extending to contact at least a portion of the metal connector fitting.

4,229,614

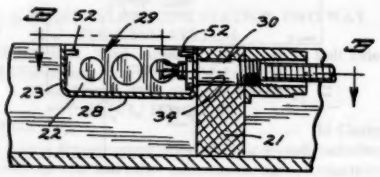
ELECTRICAL RECEPTABLE BOX AND METHOD OF INSTALLATION

Robert A. Smolik, 670 W. Seventh St., St. Paul, Minn. 55102

Filed Mar. 7, 1979, Ser. No. 18,144

Int. Cl.[3] H02G *3/10*

U.S. Cl. 174—58 10 Claims



1. An electrical receptacle mounting box mountable to an upright wall stud having a transverse, horizontal mounting hole and having a front face for installation of wallboard, said mounting box comprising:

a housing having a back wall and side walls connected to the back wall with forward edges defining a planar front housing opening;

a hollow tubular mounting stem open to the interior of the housing connected at one end to a first housing side wall and extending away therefrom in perpendicular relationship to the first side wall adapted to be inserted through the transverse hole formed in the wall stud with the outer end of the mounting stem extending from a side of the wall stud opposite the housing, said tubular member connected to said first side wall at a location to locate the planar front housing opening substantially coplanar with the front face of the wall stud when inserted in the transverse hole formed in the wall stud, said outer end of the mounting stem having a first threaded portion, said tubular stem adapted to carry a length of electrical conduit for introduction of electrical wiring into the housing;

a tubular coupler having a second threaded portion for assembly to the outer end of the mounting stem when the mounting stem is inserted through the transverse hole in the wall stud to secure the housing with respect to the wall stud;

a plurality of coplanar ears in said housing extended inwardly from the side walls of said housing and recessed relative to the housing front opening an amount sufficient to be cleared by a cutting tool being used to form an opening in a wallboard installed on the front face of the stud in covering relationship to the housing in substantial conformance with the planar front housing opening; and

means on the housing for mounting an electrical receptacle including a mounting ring at least partially insertable in said planar front housing opening, said mounting ring comprising an open frame and a plurality of legs, said legs adapted to bear upon the ears in the housing when the mounting ring is assembled to the housing, and means for fixing the mounting ring to the housing.

4,229,615

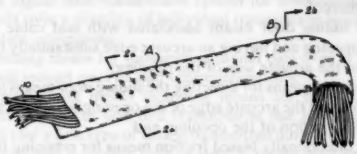
ROUND/FLAT WOVEN MULTI-CONDUCTOR CABLE

Lawrence W. Orr, Jr., Simpsonville, and Edgar A. Ross, Greenville, both of S.C., assignors to Southern Weaving Company, Greenville, S.C.

Filed Jul. 13, 1978, Ser. No. 924,366

Int. Cl.[3] H01B *7/04*

U.S. Cl. 174—117 M 4 Claims



1. A woven electrically conductive cable comprising:

a plurality of elongated conductors arranged longitudinally extending in said cable;

a continuous fill strand woven about said conductors;

a plurality of warp strands interwoven with said fill strand;

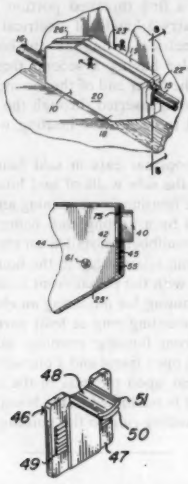
a first longitudinal section of said cable including said warp strands interwoven with said fill strands forming a cover loosely and randomly harnessing said conductors affording a high degree of flexibility for omni-directional routing of said cable in said first section; and

a second longitudinal section of said cable being continuously woven from said first section and having a generally flat configuration with said fill strand woven across the top and bottom thereof in alternating runs including at least a portion of said warp strands of said first section interwoven as warp binders between top and bottom runs of said fill strand and between conductors fixing the location of said conductors and binding said second section in said flat configuration and affording unidirectional flexibility.

4,229,616
CABLE CONNECTOR COVER

Kenneth W. Hotchkiss, Rte. 1, Blue Mountain, Golden, Colo. 80401

Filed Aug. 10, 1978, Ser. No. 932,469
Int. Cl.[3] H01R 13/52
U.S. Cl. 174—138 F 8 Claims



1. A cable connector cover, comprising:

(a) a body means for containing a cable connector therein and having a cable passage opening formed therein, said opening having an arcuate side on at least one edge thereof, the body means comprising separably joined together first and second body portions having a joining line dividing the cable passage opening and arcuate side thereof;

(b) sliding door means associated with said cable passage opening and having an arcuate edge substantially opposed to the arcuate side of the opening;

(c) guide means for directing the sliding door means in a path toward the arcuate edge of the opening to cover a substantial portion of the opening; and

(d) directionally biased friction means for retaining the door in a given position along said path toward the arcuate edge of the opening while permitting the door to be moved normally thereto substantially in the plane of the opening when said first and second body portions are separated at said joining line.

4,229,617
ASSEMBLY FOR PROCESSING PUNCHED PAPER TAPE

Joseph A. Bellino, Arlington Heights; Edmund C. Feldy, Evanston; Richard E. LaSpesa, Chicago, and Robert J. Ramig, Jr., Niles, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

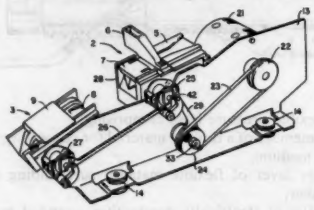
Filed Nov. 1, 1978, Ser. No. 956,836
Int. Cl.[3] H04L 15/32; G06K 7/14
U.S. Cl. 178—92 3 Claims

1. A paper tape punch and reader assembly comprising:

a housing comprising: a base member adapted to be placed on a planar surface and a complementary cover, said housing having a length, width and height;

an assembly mounting means resiliently secured to said base member, said mounting means comprising a plane surface extending upwardly at a right angle from said base member and extending substantially the said length of said housing;

a reader assembly means, a punch assembly means, and motor means mounted serially on and extending through said plane surface of said mounting means, said reader assembly means and said punch assembly means each comprising tape drive means adapted to advance punched paper tape through the respective assembly, means in said punch assembly and in said reader assembly for generating timing signals for controlling the operation of said tape drive means; adjustable eccentric means coupled to one of

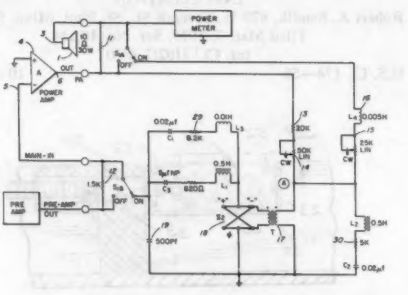


said tape drive means for imparting selected periodic motion to said drive means, belt means coupling an output pulley of said motor means to said eccentric means, and a rigid link for coupling said tape drive means to provide the application of identical periodic motion to both of said tape drive means; said paper tape drive means of said reader assembly means and of said punch assembly means, said eccentric means and said output pulley of said motor means being mounted substantially in line along but spaced apart from one face of said plane surface of said mounting means.

4,229,618
HIGH-FIDELITY SPEAKER WITH NEGATIVE FEEDBACK

George W. Gamble, One Phlox La., Acton, Mass. 01720

Filed Oct. 30, 1978, Ser. No. 955,534
Int. Cl.[2] H04R 3/00
U.S. Cl. 179—1 F 7 Claims



1. High-fidelity speaker system comprising in combination

a moving-coil loudspeaker having a voice coil and a coil input terminal

an audio amplifier associated therewith, said audio amplifier having an input terminal and an output terminal,

an output resistance connected between said output terminal and said coil input terminal, an input resistance,

means for applying an audio voltage signal to said input terminal via said input resistance, whereby a current i, is produced in said input resistance,

an impedance network connecting said input terminal to said

output terminal and being so related to said input resistance that the desired amplification is obtained and having components such that there is a point in said network at which the voltage is proportional to $di_i/dt + i_i$,

and means for causing the voltage at said coil input terminal to track the voltage at said point.

4,229,619

METHOD AND APPARATUS FOR DRIVING A MULTI WAY SPEAKER SYSTEM

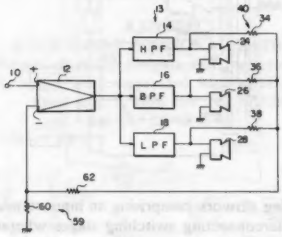
Nobuaki Takahashi; Eiichi Funasaka; Masanobu Shinozaki, and Yasuo Kaizu, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 31, 1978, Ser. No. 956,265

Claims priority, application Japan, Nov. 1, 1977, 52/131010; Nov. 1, 1977, 52/131011; Nov. 1, 1977, 52/131012; Nov. 1, 1977, 52/131013; Nov. 10, 1977, 52/134967; Nov. 14, 1977, 52/136523

Int. Cl.[2] H04R *3/00*

U.S. Cl. 179—1 D **23 Claims**



1. A method of driving a multi way speaker system comprising the steps of:

(a) amplifying an audio signal;

(b) dividing the amplified audio signal into a plurality of frequency ranges;

(c) driving a plurality of speakers the frequency characteristics of which respectively correspond to said frequency ranges, by the divided audio signals respectively;

(d) producing a composite signal by combining at least two of the divided audio driving signals with each other; and

(e) feeding said composite signal back to a stage which carries out said step of amplifying said audio signal so as to establish a negative feedback loop.

4,229,620

MOBILE RADIOTELEPHONE STATION TWO-WAY RANGING SYSTEM

Clifford W. Schaible, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1978, Ser. No. 959,095

Int. Cl.[3] H04Q *7/04*

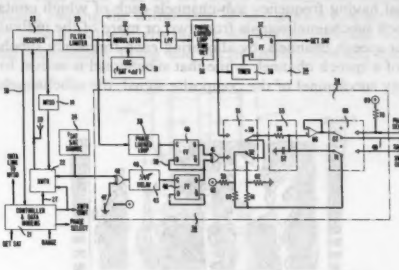
U.S. Cl. 179—2 EB **14 Claims**

1. In a system for communication of radio signals including a predetermined tone and other information signal frequencies and including means for comparing (41) the phases of transmitted and transponded versions of said predetermined tone and integrating (53) the output of the comparing means to indicate range between transmitting and transponding stations of the system, the phase comparing means being CHARACTERIZED IN THAT they comprise

means for processing (46) said transmitted tone to produce a wave at a fraction of the frequency of said transmitted tone,

means for processing (40) said transponded tone to produce a wave at a frequency which is a fraction of the frequency of said transponded tone, and

means for providing (41) a binary indication in a first state when said fractional-frequency waves are of the same



polarity and in a second state when they are of different polarities.

4,229,621

TRANSMITTING MEANS FOR USE IN A HIGH SPEED, LOW NOISE DIGITAL DATA COMMUNICATION SYSTEM

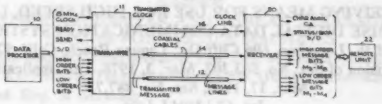
Floyd W. Looschen, 696 Cliff Dr., Laguna Beach, Calif. 92651

Division of Ser. No. 883,302, Mar. 3, 1978. This application Mar. 13, 1978, Ser. No. 885,945

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.[3] H04J *3/06*

U.S. Cl. 370—84 **5 Claims**



1. In a digital data transmission system for communicating digital data over a plurality of individual transmission lines, the combination comprising:

transmitting means for transmitting digital data over at least first and second ones of said transmission lines;

said transmitting means including means for transmitting digital data over said first transmission line in a manner such that a first type of data is transmitted during first time periods and a second type of data is transmitted during second time periods occurring between said first time periods, said first type of data being a message and said second type of data being message identifying data which identifies the type of message transmitted;

said transmitting means also including means for transmitting a clock over said second transmission line concurrently with transmission of said first and second types of data over said first transmission line and in a manner such that said clock has a first repetition rate during said first time periods and a second repetition rate during said second time periods.

4,229,622

MULTIPLEXING SPEECH SIGNALS

Peter Cochrane, Ipswich, England, assignor to The Post Office, London, England

Filed Mar. 14, 1978, Ser. No. 886,550

Claims priority, application United Kingdom, Mar. 15, 1977, 10846/77

Int. Cl.[2] H04B *1/66*

U.S. Cl. 370—81 **8 Claims**

1. Speech signal multiplexing apparatus comprising, for each input channel, a multiplicity of frequency subchannel filter

circuits; a sensor for determining the level of speech activity in each of the selected frequency subchannels for each of the speech channels and means for forming a composite output signal having frequency sub-channels each of which contains speech subchannel signals from two or more of the individual input speech channels, by allocating each frequency subchannel of a speech channel, while that subchannel is active, to an empty subchannel of the composite signal, the subchannels of

any given input signal being at least sometimes assigned to output signal subchannels which are noncontiguous and separated by output signal subchannels corresponding to subchannels of another input signal whereby the frequency subchannels of the composite speech signal are more fully occupied than those of the individual speech signals, and means for including in the composite signal a coding signal indicative of the contents of the said subchannels of the composite output signal.

4,229,623

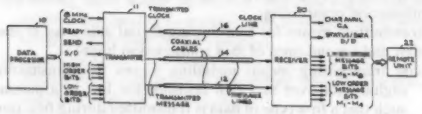
RECEIVING MEANS FOR USE IN A HIGH SPEED, LOW NOISE DIGITAL DATA COMMUNICATION SYSTEM

Floyd W. Looschen, 696 Cliff Dr., Laguna Beach, Calif. 92651

Division of Ser. No. 883,302, Mar. 3, 1978. This application Mar. 17, 1978, Ser. No. 887,720

Int. Cl.[3] H04J *3/06*

U.S. Cl. 370—4 **8 Claims**



1. Receiving means for use in a digital data transmission system in which digital data is transmitted over a plurality of individual transmission lines in a manner such that first and second types of data are transmitted over a first transmission line during respective first and second time periods and a clock is concurrently transmitted over a second transmission line in a manner such that said clock has respective first and second repetition rates during said first and second time periods, said receiving means comprising:

first input means for receiving said first and second types of data transmitted over said first transmission line;

second input means for receiving said clock transmitted over said second transmission line;

strobe generation means responsive to a clock received by said second input means for generating a plurality of strobe pulses occurring at times dependent upon the repetition rate of said clock; and

extracting means responsive to said strobe pulses and to first and second types of data received by said first input means for individually extracting each of said first and second types of data from the signal received by said first input means and for providing separate output representations thereof.

4,229,624

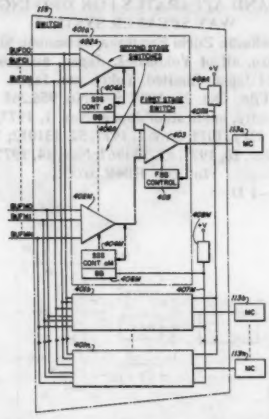
SWITCHING NETWORK CONTROL ARRANGEMENT

Dale E. Haben, Aurora; Garry D. Kepley, and Gordon L. Vander Molen, both of Wheaton, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1978, Ser. No. 972,073

Int. Cl.[2] H04Q *3/42*

U.S. Cl. 179—18 E **7 Claims**



4. A switching network comprising an input terminal and a plurality of interconnecting switching stages wherein a first stage includes control means connected to said input terminal and each of the other stages includes control means connectible to said input terminal via switching connections previously established through a preceding switching stage;

CHARACTERIZED IN THAT

said control means of said first switching stage is responsive to defined control signals applied to said input terminal for performing a first operation on switching connections in said first switching stage and said control means of at least one of said other stages is responsive to said defined control signals applied to said input terminal for performing a second operation on switching connections in said one of said other switching stages.

4,229,625

REPEATER LEVEL CONTROL CIRCUIT

Jeffrey H. Derby, New York, N.Y., and Tadikonda N. Rao, Morris Township, Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,380

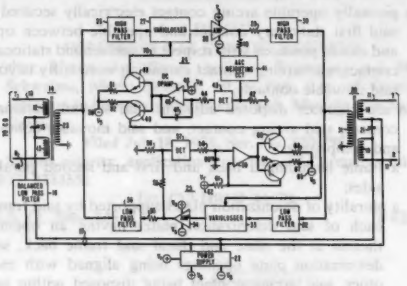
Int. Cl.[3] H04B *3/38*

U.S. Cl. 179—170 R **9 Claims**

1. A bilateral repeater for amplifying carrier signals in different frequency bands traveling in opposite directions on a common transmission line, signals in each direction of transmission being separated from signals in the other direction by filters, and a separate carrier amplifier for each direction of transmission characterized by

an automatic gain adjusting circuit in at least one direction of transmission connected to said carrier amplifier in the corresponding direction of transmission,

means for deriving gain control signals from the outputs of both of said carrier amplifiers, and



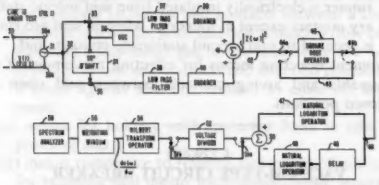
means for combining said gain control signals to continuously control said gain adjusting circuit.

4,229,626

LOOP FAULT SECTIONALIZATION

John T. Peoples, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 1, 1979, Ser. No. 62,773
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—175.3 F **9 Claims**



1. Apparatus for determining distances to impedance irregularities along a nonloaded communications cable from the input terminals thereof, having connected to such input terminals a swept-frequency signal source and a spectrum analyzer for displaying the frequencies of the maxima of the power spectrum of the derivative with respect to frequency of the phase angle of the complex impedance manifested at such input terminals, wherein the distances to impedance irregularities are proportional to the frequencies of these maxima characterized in that

means responsive to said swept-frequency signal source measures the magnitude of the input impedance of said communications cable, and

means for Hilbert transforming the difference between natural logarithms of a direct and delayed impedance magnitude from said measuring means yields the equivalent of said derivative with respect to frequency of the phase angle of said impedance.

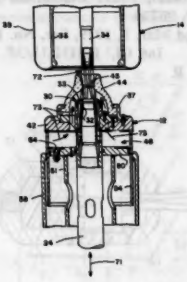
4,229,627

GAS PUFFER TYPE CURRENT INTERRUPTER AND METHOD

Joseph R. Rostron, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 4, 1978, Ser. No. 948,390
Int. Cl.³ H01H *33/00*
U.S. Cl. 200—144 R **17 Claims**

1. A method of current interruption for use in a current interrupter having a pair of relatively movable contacts including a first said contact disposed in a nozzle formed of electrically insulating material having a nozzle throat and a second said contact extending into said nozzle throat and engaging said first contact to complete a current path, said method comprising the steps of: separating said contacts to interrupt current flow such that an arc arises between said contacts, including causing the withdrawal of said second contact from said nozzle throat whereby the arc extends through said nozzle throat substantially filling said nozzle throat, directing dielectric gas into said nozzle under pressure, clogging said nozzle throat with the arc arising between said contacts to restrict escape of said dielectric gas from said nozzle, and continuing the clogging of said nozzle throat to an extent sufficient to raise the temperature within said nozzle such that significant ablation of said nozzle material occurs within said nozzle thereby producing a significant increase in pressure within said nozzle to rapidly extinguish said arc.

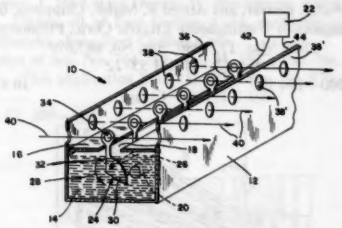


4,229,628

COMBINED DAMPER AND THREAD BREAKAGE SENSOR FOR TEXTILE MACHINES

Bogdan Bogucki, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,779
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2736979
Int. Cl.³ B65H *25/14*
U.S. Cl. 200—61.18 **9 Claims**



1. A combined damper and thread breakage sensor for textile machines, comprising:

(a) a housing having means for retaining an electrically non-conducting liquid;

(b) first contact means disposed within said non-conducting liquid adapted to be coupled to an electrical circuit means;

(c) second contact means, disposed within said non-conducting liquid, said second contact means extending beyond said housing and having means for guiding thread in a first position, said second contact means moving about a pivot point to a second position upon breakage of said thread and coming into electrical contact with said first contact means, said second contact means being adapted to be

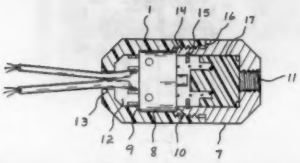
coupled to said electrical circuit means, said first and second contact means completing an electrical circuit path of said electrical circuit means when in intimate contact.

4,229,629

MINIATURE PNEUMATIC SWITCH ACTUATOR

Eugene J. Pawlowski, 10621 Bloomfield Ave., Unit 32, Los Alamitos, Calif. 90720

Filed Mar. 1, 1979, Ser. No. 17,065
Int. Cl.³ H01H *35/38*
U.S. Cl. 200—82 R **1 Claim**



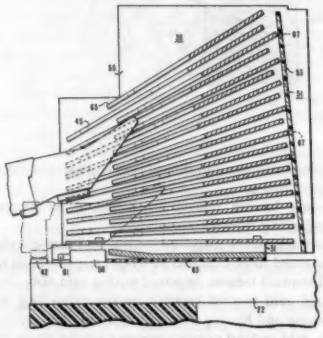
1. A miniature pneumatic switch device having a two-piece capsule-shaped housing connected by a thread means, a first half of said housing having an internal thread and a bore with a shoulder of predetermined depth in which a switch with wires attached is retained on centerline, said wires protruding beyond said shoulder through an aperture at the end of said housing, the other half of said housing having an external thread of predetermined length extending from a shoulder to provide an assembly means of said two-piece housing and a means of retaining said switch in position, said other half of housing having a smaller bore with a flat bottom of predetermined depth, said bottom having a threaded inlet port to allow pressure to enter therein, said smaller bore having a spring-biased free-floating piston limited in axial movement toward said switch by a retaining ring, whereby said piston causes actuation of said switch when pressure is applied to said inlet port.

4,229,630

CIRCUIT BREAKER UTILIZING IMPROVED ARC CHAMBERS

John A. Wafer, Beaver, and Alfred E. Maier, Chippewa, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 17, 1980, Ser. No. 887,894
Int. Cl.³ H01H *33/12*
U.S. Cl. 200—144 B **10 Claims**



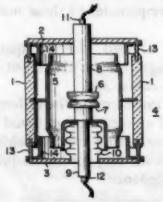
1. A circuit breaker comprising:
first and second spaced apart stationary contacts;
a plurality of pivotally operable movable contacts electrically secured to said first stationary contact and operable between open and closed positions with respect to said second stationary contact;
a pivotally operable arcing contact electrically secured to said first stationary contact and operable between open and closed positions with respect to said second stationary contact, said arcing contact extending outwardly beyond said movable contacts;
an arc chamber disposed adjacent said second stationary contact, said arcing contact, and said movable contacts and comprising:
a frame including a back and first and second parallel sides;
a plurality of deionization plates supported by said frame, each of said deionization plates having an opening therein at the plate end distal said frame back, said deionization plate openings being aligned with each other, said arcing contact being disposed within said deionization plate aligned openings, said deionization plates being of first and second differing lengths, said deionization plates being supported by said frame with alternate deionization plates being of the same length;
a generally U-shaped arc runner secured to one of said deionization plates, said arc runner being secured to said second stationary contact at locations adjacent said movable contacts and on opposite sides of said arcing contact, said arc runner having an opening therein aligned with said deionization plate openings; and
an insulating member disposed intermediate said arc runner and said second stationary contact such that said arc runner is electrically insulated from said second stationary contact except at locations wherein said arc runner is secured to said second stationary contact; and
movement effecting means for effecting movement of said movable and arcing contacts between said open and closed positions.

4,229,631

VACUUM-TYPE CIRCUIT BREAKER

Hideo Arakawa; Takashi Namekawa; Keiichi Kuniya, and Hiroyuki Sugawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 626,921, Oct. 29, 1975, abandoned.
This application Jul. 6, 1978, Ser. No. 922,368
Claims priority, application Japan, Nov. 1, 1974, 49-126782
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **12 Claims**



1. A vacuum-type circuit breaker comprising an evacuated container, and a pair of contacts disposed in said container and adapted to be moved between an open position and a closed position to permit a circuit breaking arc to be generated across the contacts, said contacts consisting substantially of a copper alloy which is cast from a melt, said alloy containing an intermetallic compound of manganese and a metal selected from the group consisting of aluminum, silicon, zirconium, nickel, titanium and chromium, such that said contacts have a high initial dielectric strength, which dielectric strength is not substantially reduced as said contacts are repeatedly moved between

an open position and a closed position to permit a circuit breaking arc to be generated across the contacts.

4,229,632

COMPRESS GAS CIRCUIT BREAKER

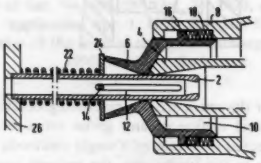
Walter Hertz; Jan Stroh, both of Erlangen, and Heinz Schwalme, Markt Erlbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 18, 1978, Ser. No. 925,795

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1977, 2733551

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 A **4 Claims**



1. A compressed gas circuit breaker comprising:

(a) first and second contacts disposed coaxially, and movable in their axial direction with respect to each other;

(b) a nozzle-like insulator body supported for movement with respect to one of said contacts between a first position where it forms, with said one contact, a flow canal for directing compressed gas to the area of an arc which is drawn between said contacts and a second position where it abuts against said one contact to close off said flow canal;

(c) means for holding said insulating body in said second position; and

(d) means responsive to relative movement of said contacts for releasing said means for holding during separation of said contacts always as soon as the minimum quenching distance of said contacts is reached whereby said insulating body may move to said first position to open said flow canal to quench an arc drawn between said contacts.

4,229,633

PROGRAMMABLE SWITCH

Edward L. Gillilan, 3251 Cypress Creek Rd., Pompano Beach, Fla. 33062

Filed Mar. 27, 1978, Ser. No. 890,123

Int. Cl.² H01H *13/52, 13/06*

U.S. Cl. 200—159 B **4 Claims**

1. An indelibly inscribable programmable switch assembly for use with an electrical circuit, comprising:

at least one switch body, each said switch body; and

at least one indelibly inscribable switch means operable by indelibly inscribing on said inscribable switch, said inscribable switch connected to said switch body;

said switch body including a carrier means connected to said body adjacent said inscribable switch;

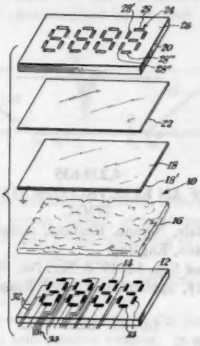
said inscribable switch including an indelibly inscribable means, a first conductive means and a second conductive means, said first conductive means positioned between said inscribable means and said second conductive means;

said first conductive means and said second conductive means for providing switching elements;

said second conductive means connected to said carrier means, said first conductive means and said inscribable means connected to said switch body, said second conductive means positioned for electrical switching relative to said first conductive means, said inscribable means for indelibly inscribing indicia thereon by deforming said inscribable means and moving said first conductive means to provide a switched marking when switching said inscribable switch means,

said inscribable means positioned to be accessible through said switch body for movement of said first conductive means relative to said second conductive means for switching;

said first conductive means and said second conductive means form an electrical circuit when said first conductive means is in electrical contact with said second conductive means;



said second conductive means including at least one electrical contact surface;

each said contact surface separately connectable to separate terminal means;

said first conductive means separately connectable to a separate terminal means; and

insulation means located between said first conductive means and said second conductive means when in an open position.

4,229,634

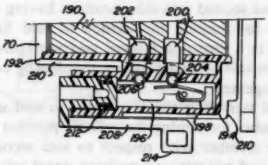
INSULATED SWITCH ARRANGEMENT FOR ELECTRIC MOTOR

Clarence J. Hickman; Donald W. Ruehmann, and Christopher W. Elkins, all of Fort Collins, Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Division of Ser. No. 764,280, Jan. 31, 1977, Pat. No. 4,108,167. This application Feb. 21, 1978, Ser. No. 879,498

Int. Cl.³ H01H *9/04*

U.S. Cl. 200—302 **11 Claims**



1. In an electric motor assembly which includes a rotor, a structure for concentrating a magnetic field delivering energy to said rotor, a switch for supplying electrical power to said motor and having electrical terminals, an electrical winding on said structure and responsive to said electrical power for inducing said magnetic field, and a contact element included in said switch for selectively conductively bridging said terminals, the improvement comprising:

an insulated carrier of said contact element for enabling

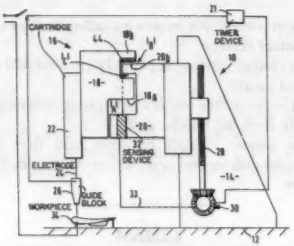
movement of said element into and out of bridging connection of said terminals;
means for mounting said winding;
an insulated housing within which said carrier is movably disposed and which is joined in fixed relationship to said mounting means;
means, including a sealing element commonly embracing said mounting means and said housing, for effecting an hermetic sealing entirely of said winding and said housing;
and means for moving said carrier within said housing to effect movement of said contact element.

4,229,635

CONTROL OF AN ELECTRO-DISCHARGE MACHINE TOOL

Raymond Dinsdale, Nelson, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 12, 1978, Ser. No. 941,578
Claims priority, application United Kingdom, Oct. 8, 1977, 41961/77
Int. Cl.³ B23P *1/12*
U.S. Cl. 219—69 G **5 Claims**



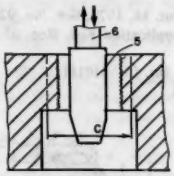
1. Electro-discharge machining apparatus for machining a workpiece comprising:
a first movable member for carrying an electrode;
servo control means for controlling the speed of said first movable member in response to the voltage between said electrode and a surface of said workpiece;
a second movable member against which said first member is located in relative sliding engagement;
said first and second movable members having overlapping portions for limiting the motion of said first movable member in a direction toward said workpiece and with respect to said second movable member by causing abutting engagement;
sensing and signalling means coupled to said second movable member for sensing the relative position of said first movable member with respect to said second movable member and generating a position signal related thereto; and
drive means responsive to said position signal for moving said second movable member toward said workpiece at a speed relative to the speed of said first movable member so as to control the abutting of said overlapping portions,
whereby after the abutting of said overlapping portions, the speed of said first movable member toward said workpiece and the speed of said electrode are controlled by the speed of said second movable member toward said workpiece.

4,229,636

SPARK EROSION MACHINING PROCESS

Gerard Izari, Montreuil Juigne, France, assignor to Cegedur Societe de Transformation de l'Aluminum Pechiney, Paris, France

Filed May 22, 1979, Ser. No. 41,297
Claims priority, application France, Jun. 1, 1978, 78 17224
Int. Cl.³ B23P *1/12*
U.S. Cl. 219—69 M **12 Claims**



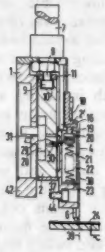
1. A process for the spark erosion machining of a workpiece having a cylindrical orifice of any given cross-section, the process being effected by means of a single electrode which is displaced relative to the workpiece, the process sequentially comprising the steps of:
making a first rapid rough pass relative to the workpiece by causing the electrode to descent through the orifice parallel to the generatrices of the orifice to spark erode surfaces of the orifice;
raising the electrode;
translating the electrode perpendicularly to the generatrices by a distance r so that a point is located at P_1 on the surfaces of the orifice;
lowering the electrode into the rough orifice parallel to the generatrices;
rasing the electrode;
translating the electrode to a point located at P_2 on the surfaces of the orifice;
lowering the electrode parallel to the generatrices;
raising the electrode; and
repeating the translation, lowering, and raising steps n times until the translation has made a complete revolution.

4,229,637

SPOT WELDING ASSEMBLY FOR ELECTRICAL RESISTANCE WELDING

Güenter Dederer, Germering, and Helmut Müerkl, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,413
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738854
Int. Cl.³ B23K *11/10*
U.S. Cl. 219—86.25 **11 Claims**



1. A first spot welding assembly for electrical resistance welding comprising: a base carrier fixture, a feed slide block

linearly movably carried by said base, ball bearing slides interposed between the feed slide block and said base, an electrode slide block linearly movably carried by the feed slide block, ball bearing slides interposed between the feed slide block and the electrode slide block, spring means between the feed slide block and electrode slide block biasing the electrode slide block linearly of the feed slide block, the electrode slide block terminating in a welding electrode clamp, adjusting means accessible from the exterior of the electrode slide block for adjusting a biasing face of the spring means.

4,229,638

UNITIZED ROTARY ROCK BIT

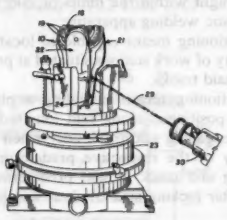
Carl L. Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 409,207, Oct. 24, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,014

The portion of the term of this patent subsequent to Sep. 23, 1992, has been disclaimed.

Int. Cl.[2] **B23K** *15/00*

U.S. Cl. 219—121 EM **3 Claims**



1. A reliable method for repeatedly constructing three cone rotary rock bits that will have a gate diameter of an accurate gage size, comprising the steps of:

providing each of said segments with substantially plane faces and a gage cutting structure;

positioning said three individual segments together with a plane face of each segment abutting a plane face on another segment so that said abutting faces are slightly out of alignment and not precisely coterminous, placing said gage cutting structure at said gage diameter thereby providing said rotary rock bit with an accurate gage size, said three individual rock bit segments being in the proper position for the final assembled bit with seams between the individual segments;

aligning said seams with an electron beam gun so that the plane of each seam is aligned with a beam of electrons produced by said electron beam gun;

directing said beam of electrons into said seams; and

causing relative movement of said beam of electrons and said individual segments in the plane of said seams to join said individual segments together by an electron beam weld.

4,229,639

ENERGY BEAM WELDING METHOD

Johannes Koy, Germering; Franz Rappold, and Erwin Kappelsberger, both of Munich, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Fed. Rep. of Germany

Filed Aug. 16, 1977, Ser. No. 826,395

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637371

Int. Cl.[3] **B23K** *15/00*

U.S. Cl. 219—121 EM **17 Claims**

1. A method for producing an elongated weld seam in a workpiece by means of a beam of charged particles, said method comprising the steps:

(a) producing a beam of charged particles directed to a point of impingement on said workpiece; said beam having a selected beam current and a selected accelerating voltage and being focused by a focussing field of selected field strength;

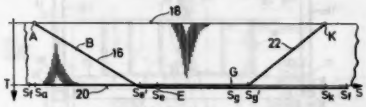
(b) producing a relative motion of said beam with respect to said workpiece to move said point of impingement along said workpiece, said relative motion having a selected instantaneous velocity;

(c) changing at least one parameter selected from a first group consisting of

(c1) beam current, and

(c2) velocity of relative motion to change the depth penetration of the beam into said workpiece;

said method further characterized by the step



(d) changing, by active direct control, concurrent with said first parameter group change, at least one parameter selected from a second group consisting of:

(d1) strength of focussing field;

(d2) amplitude of periodic beam deflection in a direction parallel to said relative motion;

(d3) amplitude of periodic beam deflection in a direction transverse to said relative motion;

(d4) frequency of periodic beam deflection in a direction parallel to said relative motion;

(d5) frequency of periodic beam deflection in a direction transverse to said relative motion.

4,229,640

WORKING PIECES BY LASER BEAM

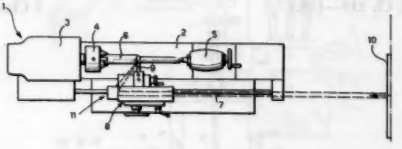
Massimo Castellani Longo, Turin, Italy, assignor to R.T.M.-Istituto per le Ricerche di Tecnologia Meccanica, Vico Canavese (Turin), Italy

Filed Jan. 17, 1979, Ser. No. 4,128

Claims priority, application Italy, Jan. 18, 1978, 67089 A/78

Int. Cl.[3] **B23K** *27/00*

U.S. Cl. 219—121 LJ **4 Claims**

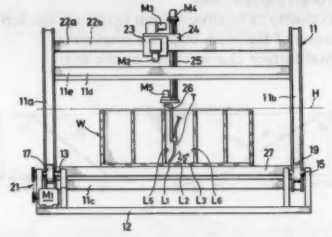


1. Process for machining a workpiece by the use of a cutting tool having a cutting edge and an adjacent leading face which lifts shavings from the workpiece material, the process including the localized heating of the workpiece material about to be removed by means of a laser beam arranged to heat two distinct local areas of the workpiece adjacent the cutting tool: a first area immediately in front of the cutting edge of the tool and a second area adjacent the leading face of the cutting tool in a part of the workpiece material which is deformed plastically by the tool in the formation of a shaving.

4,229,641
AUTOMATIC WELDING APPARATUS

Yasushi Ihara, Takarazuka, Japan, assignor to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed Sep. 1, 1978, Ser. No. 939,151
Claims priority, application Japan, Sep. 1, 1977, 52-105706
Int. Cl.[2] B23K *37/02*
U.S. Cl. 219—125.1 19 Claims

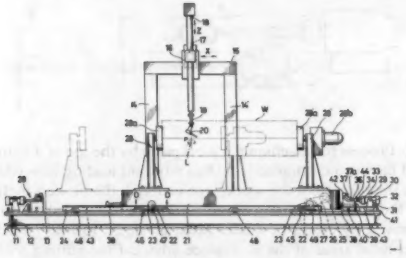


1. An automatic welding apparatus for welding the interior joint portions of long box-like or tubular workpieces, said welding apparatus comprising a pair of spaced-apart, but interconnected, turn frames swingable in unison around a horizontal axis passing through the two frames, said turn frames having three members mounted therebetween, said three members being slidable in respectively said horizontally axial direction, a second direction orthogonal to said horizontally axial direction and a third direction orthogonal to said second direction; a workpiece-fixture means for holding said box-like or tubular workpieces; a welding torch; and a fixture means for holding said welding torch, wherein said workpiece-fixture means is mounted on said turn frames to move in unison therewith and said torch fixture means is mounted on one of said sliding members for rotation around an axis in said second direction or said third direction, so that said workpiece-fixture means and said torch fixture means can be respectively positioned relative to one another in three dimensions and so that the attitudes of both of these members can be changed in unison relative to the earth, for welding the interior joint portions of long box-like or tubular workpieces.

4,229,642
AUTOMATIC WELDING APPARATUS FOR LONG WORKPIECES

Hajime Sakurai, Kobe, and Yoshinori Higuchi, Osaka, both of Japan, assignors to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed Aug. 31, 1978, Ser. No. 938,541
Claims priority, application Japan, Aug. 31, 1977, 52-105356
Int. Cl.[2] B23K *37/04*
U.S. Cl. 219—125.1 5 Claims

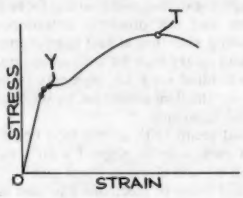


1. An automatic welding apparatus comprising:
a welding torch;
a composite frame adapted to movably mount said torch such that said torch may be located at a predetermined position within a work space;
said composite frame adapted to move said torch in a longitudinal direction, a lateral direction, and a vertical direction as well as being rotatable around a vertical axis;
a workpiece holder for securing a workpiece thereto such that said workpiece or portions thereof are located within the limits of said work space;
said workpiece holder including a pair of spaced apart fixtures which are rotatable around a horizontal axis;
means for controlling the angular position of said pair of spaced apart fixtures;
a movable base for supporting either said frame or said workpiece holder such that said frame and said holder are movable with respect to one another along a longitudinal axis;
said movable base including a truck provided with a reversible motor adapted to drive said truck along a pair of spaced apart, parallel tracks;
positioning means for positioning said truck along said longitudinal axis such that all portions of said workpiece may be brought within the limits of said work space of said automatic welding apparatus;
said positioning means capable of locating said truck at a plurality of work stations situated at predetermined points along said tracks;
said positioning means including a plurality of locating means positioned along said longitudinal axis for selectively engaging said truck only when said truck is in the vicinity of the respective predetermined positions and moving said truck to said predetermined positions and thereafter locking said truck at said predetermined positions.

4,229,643
CONSUMABLE WELDING ELECTRODE

Robert A. Caldwell, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 12, 1978, Ser. No. 914,360
Int. Cl.[3] B23K *35/30*
U.S. Cl. 219—146.24 2 Claims



1. A consumable welding electrode having the following alloying constituents by percent weight of the total electrode:

About 1.90%	to about	2.10% manganese
About 0.30%	to about	0.45% silicon
About 0.5%	to about	1.5% nickel;

and in which the weight of the carbon content of said welding electrode does not exceed about 0.05% of the total electrode weight; and in which the respective weights of the following elements do not exceed the following percentages of the weight of the total electrode:

Phosphorus:	about 0.02%
Sulfur:	about 0.02%

-continued

Chromium:	about 0.03%
Molybdenum:	about 0.01%
Aluminum:	about 0.01%
Copper:	about 0.03%
Titanium:	about 0.01%

and in which the hydrogen content of said electrode does not exceed about 10.0 parts per million and the oxygen content of said electrode does not exceed about 1500 parts per million; and in which substantially the entire balance of the weight of said electrode is iron.

4,229,644

HEAT PIPE ROLLER

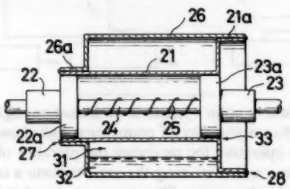
Ryoichi Namiki, Hino, and Yasuro Hayashi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Oct. 14, 1977, Ser. No. 842,099

Claims priority, application Japan, Oct. 20, 1976, 51/125914; Nov. 30, 1976, 51/143794

Int. Cl.³ F28D *11/02;* **F28F** *5/02*

U.S. Cl. 219—469 **4 Claims**



1. A heating roller for fixing an image in a copying apparatus comprising, a one piece inner cylinder having one small diameter end portion and one opposite large diameter end portion, heating means disposed within said inner cylinder, a one piece outer cylinder having a small diameter end portion and a large diameter end portion disposed around said inner cylinder which is inserted onto said inner cylinder in the axial direction of said inner cylinder with said outer cylinder large diameter end portion inserted first onto said inner cylinder small diameter end portion, said outer cylinder large and small end portions airtightly fixed to said large and small end portions of said inner cylinder respectively along two sealing areas of mutual surface contact therebetween, with a space defined in an uncontacting portion between said outer cylinder and said inner cylinder, heating medium which is evaporated under application of heat by said heating means held in said space, and stop means which is disposed in an end wall which forms said space, said stop means being for reducing the pressure within said space in order to place and seal said heating medium in said space.

4,229,645

DETECTOR AND RECORDER OF HOLES AND DISRUPTIONS IN PLASTIC MATERIAL SHEETS AND WEBS

Carlo Vigano, Cavaria; Francesco Quattrone, Milan, and Erio Toffanetti, San Donato Milanese, all of Italy, assignors to Anic S.p.A., Palermo and Costruxioni Elettriche Automatiche Impianti (C.E.A.I), Busto Arsizio, both of, Italy

Filed May 15, 1978, Ser. No. 906,219

Claims priority, application Italy, May 20, 1977, 23804 A/77

Int. Cl.³ G06M *7/00*

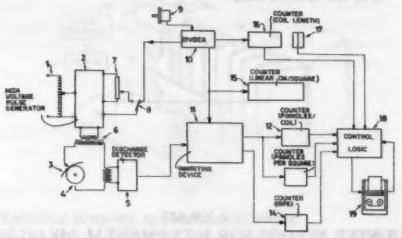
U.S. Cl. 235—92 QC **4 Claims**

1. A device for detecting pin holes on moving films or webs of plastic materials comprising:

a high voltage electrode and a grounded roller between which the web passes during coiling;

means coupled to the roller for detecting pin holes in the web based on electrical discharges; and

means for counting rips in the web, said rip counting means including an inhibiting device coupled to said detecting means and comprising a flip-flop, a first counter for recording pin holes by counting discrete electrical discharges, a second counter for recording consecutive elec-



trical discharges indicative of a rip, gating means responsive to said flip-flop for coupling signals of said detecting means to said first and said second counters, said gating means including means responsive to a rate of occurrence of consecutive discharges to set said flip-flop for switching signals of said detecting means to the second counter, and means for resetting the flip-flop to signal discrete discharges after a preselected length of film having no defects has run past.

4,229,646

ELECTRONIC COUNTER FOR INCREMENTAL MEASURING DEVICE

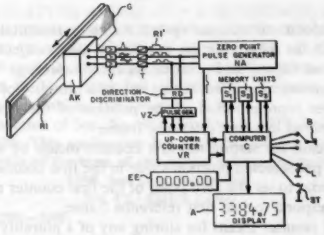
Horst Burkhardt, Truchtlaching; Ernst Schwefel, Traunreut; Alfons Baumgartner, Grassau; Anton Mayer, Fridolfing, and Michael Rauth, Traunreut, all of Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 923,807

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732954

Int. Cl.³ G06M *3/14*

U.S. Cl. 235—92 GC **21 Claims**



1. An apparatus for a measuring device for measuring the position of a first object relative to a second object, said apparatus comprising:

counter means for storing a position value representatives of the position of the first object;

at least one memory means for storing a predetermined reference point value;

means for selectively designating the memory means, including switch means having at least a first state and a second state;

computing means, coupled to the counter means, the memory means, and the designating means, for generating an output value;

first means, included in the computing means, for setting the output value to correspond to the position value when the switch means is in the first state; and

second means, included in the computing means, for setting the output value to correspond to the position value algebraically combined with the reference point value stored in the at least one memory means when the switch means is in the second state.

4,229,647

COUNTER SYSTEM FOR INCREMENTAL MEASURING INSTRUMENT

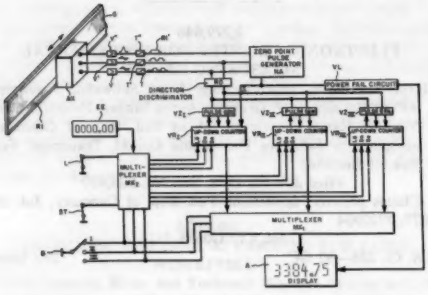
Horst Burkhardt, Truchtlaching, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 923,810

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732909

Int. Cl.³ G06M *3/06*

U.S. Cl. 235—92 GC **9 Claims**



1. An electronic counter system for an incremental measuring device for measuring the position of a first object relative to a second object, said counter system comprising:

first counter means for storing any of a plurality of position values representative of the position of the first object measured in a first reference frame;

first means for setting the first counter means by storing a first pre-selected position value in the first counter means in order to set the zero point of the first counter means to correspond to said first reference frame;

second counter means for storing any of a plurality of position values representative of the relative position of the first object measured in a second reference frame;

second means for setting the second counter means by storing a second pre-selected position value, independent of said first pre-selected value, in the second counter means in order to set the zero point of the second counter means to correspond to said second reference frame;

means for utilizing the position values stored in first and second counter means; and

switching means for selectively and alternately connecting the first and second counter means to the utilizing means.

4,229,648

ADDITIVE COLOR SYSTEM WITH COMPENSATION OF REPEATABILITY ERRORS OF VARIABLE-DENSITY ELECTROOPTICAL FILTER UNITS

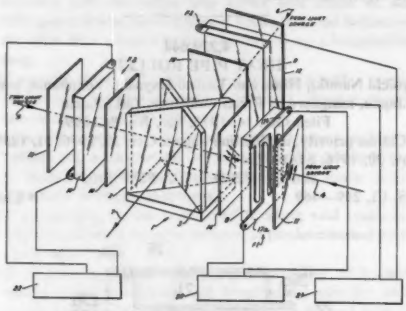
Franz F. Ehrenhaft, Forest Hills, N.Y., assignor to Anamorphic Ltd., Forest Hills, N.Y.

Continuation of Ser. No. 769,838, Feb. 17, 1977, Pat. No. 4,095,099. This application Jun. 21, 1978, Ser. No. 920,375

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.³ G01J *1/32*

U.S. Cl. 250—205 **5 Claims**



1. In an additive color system, in combination, light source means providing a plurality of component light beams; combining means operative for receiving the plurality of component light beams and combining the same to form a composite light beam; light-attenuating filter means arranged in the paths of respective ones of said light beams operative for controlling the color balance and intensity of the composite beam, and including electrooptical filter means provided with control electrodes and being operative for attenuating the respective light beam to an extent dependent upon the control voltage applied across the control electrodes, transmission-value-establishing means operative for setting the electrooptical filter means to different transmission levels, including selecting means operative for selecting the transmission values to be established, control-voltage-generating means connected to the selecting means and operative for generating and applying to the control electrodes control voltages dependent upon the selected transmission values and including compensating means operative for compensating for repeatability errors in the response of the electrooptical filter means.

4,229,649

PHOTO ELECTRICALLY PROGRAMMED STEERING CONTROL

Royal R. Hawkins, Bloomington, and Leland E. Kuntz, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 957,957

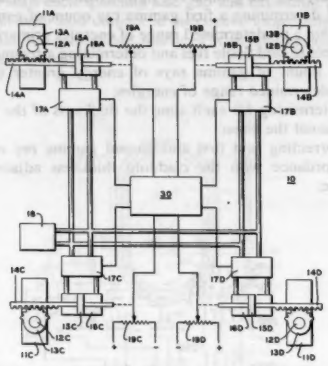
Int. Cl.² B62D *5/00*

U.S. Cl. 250—215 **17 Claims**

1. A steering system for a vehicle, the vehicle having at least two steerable ground engagement means, one on each side of the vehicle, said steering system comprising:

steering control means adapted to steer said two steerable ground engagement means; and,

optical control means connected to said steering control means, said optical control means being optically profiled



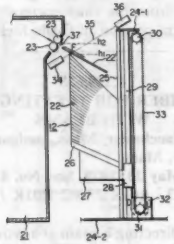
so that, in a turn, both said two steerable ground engagement means are steered about a common center.

4,229,650

POSITION AND PRESENCE DETECTING DEVICE FOR STACKED SHEET MEMBERS

Yuji Takahashi, Tokyo, and Hisaji Masaki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1978, Ser. No. 969,367
Claims priority, application Japan, Dec. 14, 1977, 52-150342
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—223 R **14 Claims**



1. A position detecting device for stacked sheet members, comprising:

transport means for transporting sheet members;

a sheet stacking member for stacking thereon the sheet member transported by said transport means;

sheet detecting means positioned in such a manner as to detect the passage of the sheet members transported by said transport means and to detect the sheet members stacked on said sheet stacking member; and

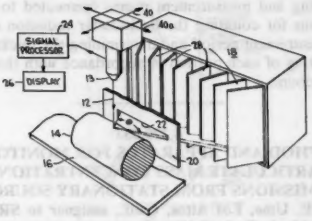
identifying means responsive to the output of said sheet detecting means for identifying that the upper end of the sheet members stacked on said sheet stacking member reaches a determined position.

4,229,651

RADIATION SCANNING METHOD AND APPARATUS

Michael Danos, 407 Muddy Branch Rd., Gaithersburg, Md. 20760

Continuation of Ser. No. 821,725, Aug. 4, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 9,398
Int. Cl.[2] G01N *23/20*
U.S. Cl. 250—272 **22 Claims**



1. Radiation scanning apparatus comprising

radiation source means for directing a beam of X-radiation through an object to be examined to produce scattered radiation therefrom along the path of the beam through the object;

radiation detector means positioned to detect scattered radiation produced by directing said beam of radiation through the object;

a mask disposed between the object to be examined and said radiation detector means; and

slit means formed in said mask and having its elongated dimension extending transverse to the path of the beam of radiation for passing through the mask to said radiation detector means that part of the radiation which is scattered from each point of the object along the path of the beam and which lies within a predetermined included angle;

said elongated dimension of said slit means being substantially greater than the other dimension of said slit means;

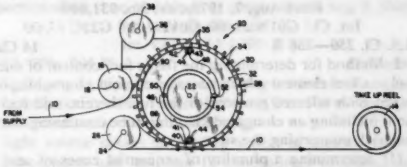
said detector means including means for examining bands of the scattered radiation passed through said slit means to produce signals representative of the scattered radiation in each band whereby the structure of the object lying along the path of the beam of radiation through the object may be determined.

4,229,652

BACKSCATTER APPARATUS AND METHOD FOR MEASURING THICKNESS OF A CONTINUOUSLY MOVING COATED STRIP OF SUBSTRATE MATERIAL

Jacques Weinstock, Flushing; Derek Lieber, North Merrick, and William D. Hay, Peekskill, all of N.Y., assignors to Unit Process Assemblies, Inc., Syosset, N.Y.

Continuation of Ser. No. 803,250, Jun. 3, 1977, Pat. No. 4,115,690. This application Jun. 2, 1978, Ser. No. 911,974
The portion of the term of this patent subsequent to Sep. 19, 1995, has been disclaimed.
Int. Cl.[3] G01N *23/00*
U.S. Cl. 250—308 **7 Claims**



1. A backscatter thickness measuring apparatus for measur-

ing the thickness of a coating on a strip of substrate material moving at a predetermined speed from a feed supply to a take-up location comprising:

a probe means for irradiating a portion of the coating on the strip of substrate material and detecting the backscatter radiation from such portion during a measurement period;

a probe holder moveable with the moving strip of substrate material for holding the probe means in adjacent stationary relation with such portion of the coating on the strip of substrate material during the measurement period; and

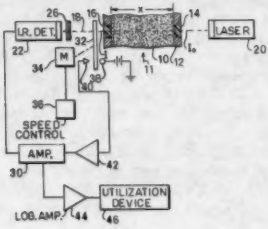
counting and measurement means connected to the probe means for counting the backscatter radiation during the measurement period and determining the thickness of the coating of such portion in accordance with the backscatter count.

4,229,653

METHOD AND APPARATUS FOR MONITORING PARTICULATE MASS CONCENTRATION OF EMISSIONS FROM STATIONARY SOURCES

Edward E. Uthe, Los Altos, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Mar. 30, 1979, Ser. No. 25,732
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—339 **10 Claims**



1. A system for use in monitoring mass concentration of a stream of particulate material for which the particle size distribution may vary, said system comprising,

a source of electromagnetic radiation for directing a beam of radiation through the particulate stream,

radiation receiver means for measuring radiation from said radiation source transmitted through said particulate stream,

said radiation source being operated at substantially a single wavelength at which the extinction coefficient-to-mass concentration ratio of the particulate material stream is substantially independent of variations in particle size for the range of particle sizes in the stream whereby the output from the receiver means provides a measure of mass concentration of the particulate material stream.

4,229,654

DETERMINING FISSILE CONTENT OF NUCLEAR FUEL ELEMENTS

Satya P. Arya, Wilmington; Leonard N. Grossman, Wrightsville Beach, and Frederick C. Schoenig, Jr., Wilmington, all of N.C., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 7, 1978, Ser. No. 931,669
Int. Cl.² G01N *23/00*; G01T *1/20*; G21C *17/00*
U.S. Cl. 250—358 R **14 Claims**

1. Method for determining the fissile fuel content of nuclear fuel in a fuel element which may also contain a burnable poison mixed with selected portions of the fuel therein, said fuel element including an elongated cladding tube containing the fuel material, comprising the steps of:

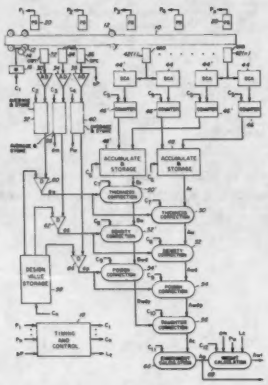
(1) determining a plurality of sequential zones of said fuel material in said fuel element;

(2) detecting the gamma ray emission due to the natural radioactive decay of said fuel material in each of said zones in sequence;

(3) analyzing the gamma ray signals from each of said zones and determining a first gamma ray count of gamma rays within a predetermined range of energies primarily attributable to said fissile fuel and determining a second gamma ray count of gamma rays of energy greater than said predetermined range of energies;

(4) determining for each zone the thickness of the cladding adjacent the zone;

(5) correcting said first and second gamma ray counts in accordance with the cladding thickness adjacent each zone;



(6) determining the density of the fuel material in each zone;

(7) further correcting said first and second gamma ray counts in accordance with the density of the fuel material in the zone;

(8) determining the weight percent of burnable poison in each of the zones;

(9) further correcting said first and second gamma ray counts for each zone in accordance with the weight percent of burnable poison in the zone;

(10) further correcting said first gamma ray count in accordance with the corrected second gamma ray count; and

(11) determining from the thus corrected first gamma ray count the weight percent of fissile fuel in each zone.

4,229,655

VACUUM CHAMBER FOR TREATING WORKPIECES WITH BEAMS

Geoffrey Ryding, Manchester, Mass., assignor to Nova Associates, Inc., Beverly, Mass.

Filed May 23, 1979, Ser. No. 41,888
Int. Cl.² A61K *27/02*; B01K *1/08*
U.S. Cl. 250—400 **24 Claims**

1. Apparatus for directing a beam at a workpiece, said apparatus including a support member for carrying said workpiece and an evacuated region surrounding said support member and the path of said beam, the source of said beam and the support member for said workpiece being relatively movable in a direction transverse to said beam, there being a sealing means accomodating said relative motion while maintaining the evacuated condition,

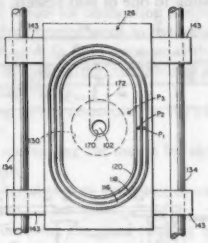
said sealing means comprising a slide member defining a planar sliding surface extending in said direction of relative motion,

a seal support member generally parallel to and spaced from said surface by a gap,

aligned apertures in said members, one of which is larger in the direction of relative motion than the other enabling said relative motion while maintaining said alignment,

a plurality of resilient seals bearing with sliding sealing contact against said planar surfaces,

said seals each spanning said gap and extending throughout with said contact in successive loops fully around said first and second apertures in all relative positions of said apertures,



said loops being such that outer loops wholly surround inner loops, and

between-seal pumping means for pumping the region radially intermediate two of said seals.

4,229,656

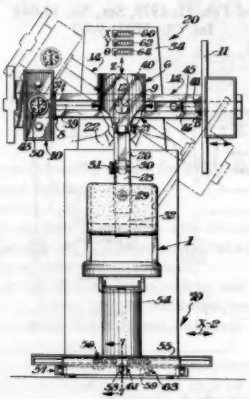
X-RAY ORIENTING APPARATUS

Arthur Iversen, and John Magyar, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 31, 1978, Ser. No. 956,327

Int. Cl.[2] G01N *21/00*; G21K *5/10*; H01J *35/16*

U.S. Cl. 250—447 **10 Claims**



10. An x-ray orienting apparatus having an x-ray source and film cassette mounted on opposite ends of a C-shaped arm which has a central pivot axis vertically movable on a support post comprising an inclinometer mounted on the C-shaped arm, and movable indicia on the inclinometer whereby it may be set to the zero position when the C-arm is adjusted to a basic setting from which sequential positions are adjusted.

4,229,657

γ-RAY IRRADIATION HEAD FOR PANORAMIC IRRADIATION

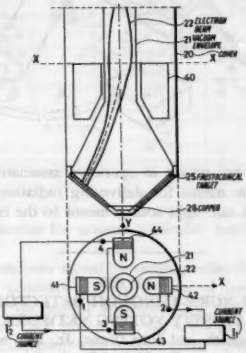
André Bensussan, and Guy Azam, both of Paris, France, assignors to CGR-MeV, Paris, France

Filed Mar. 30, 1978, Ser. No. 891,647

Claims priority, application France, Apr. 1, 1977, 77 09949

Int. Cl.[2] G21G *4/00*

U.S. Cl. 250—493 **6 Claims**



1. A γ-ray irradiation head for panoramic irradiation using a beam of charged and accelerated particles, said irradiation head having a longitudinal axis along which said particles propagate in the absence of deflection, said head comprising an electromagnetic deflection device for deflecting said charged particles and a target having an active surface revolving about the axis of the irradiation head, said deflection device separating the paths of the particles from said axis in such a way that the particles impinge upon the revolving target; said deflection device comprising a multipolar magnetic device, and a feed circuit, to deflect the beam of charged particles in its entirety and to make it converge on said target in a small impinging zone, the magnetic device being fed by said feed circuit such that the magnetic field rotates about the axis of the irradiation head, the mean deflection of the deflected beam being variable and the impinging zone moving correlatively on said target; said multipolar magnetic device being a quadripolar magnetic device, and the windings of pole pieces of said quadripolar magnetic device being fed in pairs and in series by two sinusoidal currents in quadrature delivered by the feed circuit for periodic scanning of the target by the beam of particles.

4,229,658

XENON LIGHT APPARATUS FOR SUPPLYING ULTRAVIOLET AND VISIBLE SPECTRA

Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Continuation-in-part of Ser. No. 806,316, Jun. 13, 1977, Pat. No. 4,112,335, which is a continuation of Ser. No. 560,290, Mar. 20, 1975, abandoned. This application Aug. 18, 1978, Ser. No. 934,912

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

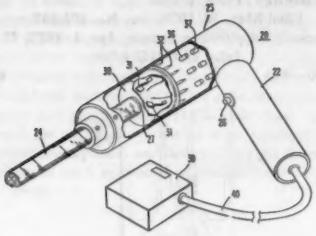
Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—504 H **22 Claims**

1. Light source apparatus for delivering a substantial continuum of radiation within a range of about 300 to 500 nanometers to a restricted surface area, comprising:

a. light source means containing xenon at greater than 3 atmospheres and less than 10 atmospheres pressure, and including a filter assembly to cut off wavelengths below about 300 nanometers;

b. a housing, adapted to contain said light source means and suitable for handheld operation;
c. means for pulsing of said light source means; and



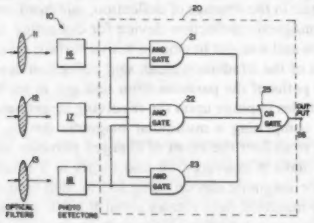
d. light delivery means in operative association with said light source means for delivering radiation within said range from said light source means to the restricted surface area.

4,229,659

OXIDIZER BURN THROUGH DETECTOR WITH MAJORITY VOTING NETWORK

Raymond A. Vaselich, and John Dixon, Jr., both of Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 17, 1978, Ser. No. 961,807
Int. Cl.[3] G02B *27/00*
U.S. Cl. 250—554 **7 Claims**



1. A system for detecting fires resulting from the escape or burn through of oxidizer from a piping system for handling the same comprising:
a plurality of photodetectors, to be positioned adjacent the oxidizer piping system and responsive to the light resulting from an oxidizer fire, for producing output signals indicating the sensing of a fire; and
a majority voting network for receiving the output signals from said photodetectors and for producing an output signal which may be used to initiate corrective action, said network producing an output only when a majority of said photodetectors simultaneously sense a fire.

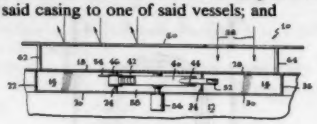
4,229,660

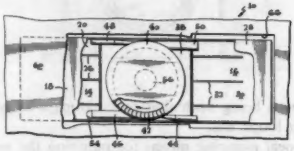
TURBINE ELECTRIC GENERATOR WITH SOLAR HEATING AND SPACE COOLING

Harold A. Adler, 1457 Eastwind Clr., Westlake Village, Calif. 91361

Filed Apr. 23, 1979, Ser. No. 32,657
Int. Cl.[3] B60L *1/02*; F03G *7/02*; F03C *5/00*
U.S. Cl. 290—2 **16 Claims**

1. A turbine electric generator unit with solar heating and space cooling comprising:
a first vessel;
a second vessel;
a turbine casing having a turbine wheel therein;
nozzle means connected to both said first vessel and said second vessel for conducting vapor flow from one of said vessels into said turbine casing to impinge upon said turbine wheel to turn said turbine wheel;
exhaust header means connected between said turbine casing and both of said vessels for conducting exhaust vapor from said casing to one of said vessels; and





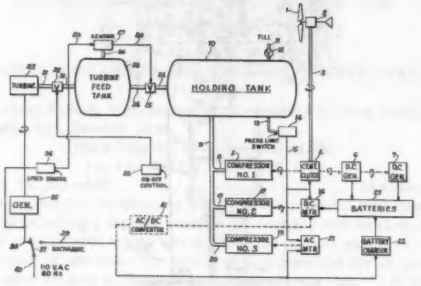
means for first selectively heating said first vessel so that thermodynamic fluid therein is heated and raised in pressure for delivering vapor under pressure to said turbine wheel and for cooling said second vessel to maintain a lower exhaust pressure in said second vessel than the vapor pressure in said first vessel so that exhaust vapor flow flows through said exhaust header into said second vessel, and said means for heating being also for selectively heating said second vessel and cooling said first vessel.

4,229,661

POWER PLANT FOR CAMPING TRAILER

Claude F. Mead, 5072 Mt. Etna Dr., San Diego, Calif. 92117, and William F. Holmes, 5515 Shasta La. #1, La Mesa, Calif. 92041

Filed Feb. 21, 1979, Ser. No. 13,044
Int. Cl.[3] F03D *9/02*
U.S. Cl. 290—44 **10 Claims**



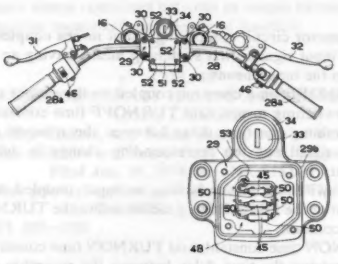
1. A power plant which comprises:
(a) first rotating means responsive to movement of a fluid;
(b) first fluid compressor driven by the first rotating means;
(c) first means for coupling the first rotating means to the first fluid compressor;
(d) first electrical energy generator driven by the first rotating means;
(e) second means for coupling the first rotating means to the first generator;

(f) means for accumulating electrical energy generated by the first generator;
(g) second rotating means responsive to said accumulated energy;
(h) second fluid compressor driven by the second rotating means;
(i) means for storing compressed fluid;
(j) fluid conduit means for connecting the outputs of the first and second fluid compressors to the means for storing;
(k) means responsive to fluid pressure within the means for storing for controlling the operation of the first and second fluid compressors;
(l) third rotating means responsive to the expansion of compressed fluid;
(m) means for connecting the means for storing to the third rotating means;
(n) second electrical energy generator driven by third rotating means; and
(o) means for coupling the third rotating means to the second electrical energy generator.

4,229,662
WIRING OF ELECTRICAL EQUIPMENTS FOR MOTORCYCLES

Ryo Nashimoto, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,274
Claims priority, application Japan, Oct. 13, 1977, 52-122887
Int. Cl.[3] H01H *85/20*; B60L *3/04*
U.S. Cl. 307—9 **8 Claims**

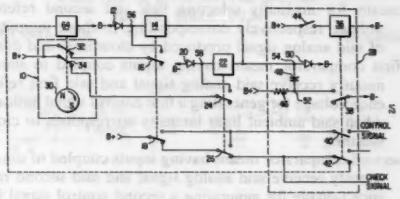


1. An electrical wiring system for a motorcycle, comprising:
an electrical battery;
a main switch;
electrical conductors operably and electrically connecting said main switch to said electrical battery;
a plurality of electrical equipments;
a plurality of sub-switches operably and electrically connected to each of said electrical equipments, respectively;
said sub-switches being disposed adjacent to the handlebars of said motorcycle;
a plurality of sub-fuses operably and electrically connected between said main switch and each of said sub-switches respectively;
said plurality of sub-fuses being substantially concentratedly arranged above a top bridge supporting a steering handlebar and a front fork assembly of said motorcylce proximal a steering stem of said motorcylce;
a steering handlebar upper-holder member which fixes said steering handlebar on said top bridge; and
said plurality of sub-fuses being substantially horizontally arranged on said upper-holder member.

4,229,663
APPARATUS FOR SENSING VEHICULAR MECHANICAL MOTION

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,766
Int. Cl.[2] B60N *5/00*
U.S. Cl. 307—9 **5 Claims**

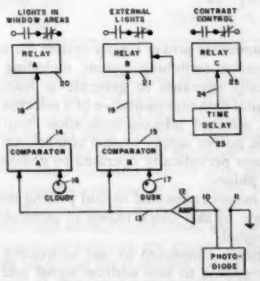


1. An apparatus for sensing vehicular mechanical motion, comprising:
motion transducer means for sensing vehicular displacement and for generating plural groups of transducer signals based on the sensed displacements, with the transducer signals of each group bearing a predetermined relative phase relationship with respect to the transducer signals of the other groups;
a plurality of latching switch circuits, each having applied thereto a particular one of said groups of signals produced by said transducer means, each latching switch circuit capable of being set to a first motion sensitive output state and subsequently latched to a second output state upon the application thereto of a signal from the respective group of signals;
first means for setting each of said latching switch circuits to said first output state upon initiation of a motion sensitive operation; and,
second means connected to said latching switching circuits for detecting when each of said latching switching circuits is in said second output state, said second means then generating a motion detected signal.

4,229,664
PHOTO ELECTRIC METHODS AND APPARATUS FOR REGULATING ELECTRICAL POWER CONSUMPTION IN STORES

Frederick H. Blake, 226 W. Edith Ave., No. 28, Los Altos, Calif. 94022, and Manfred K. Dittmann, 2544 Sun Mor Ave., Mountain View, Calif. 94040

Filed Mar. 15, 1979, Ser. No. 20,755
Int. Cl.[3] H05B *37/02*; H01H *47/24*
U.S. Cl. 307—117 **5 Claims**



1. A controller for automatically regulating the consumption

of electrical energy in a store, said controller being comprised of;

photo diode means for placement external to said store to form electrical impedances representative of the ambient light intensity,

amplifier means having inputs connected to said photo diode and being responsive to the impedance thereof for generating an analog signal having a magnitude indicating said ambient light intensity;

means for manually selecting first and second reference voltage respectively corresponding to those magnitudes of said analog signal produced by cloudiness and dusk;

first comparator means having inputs coupled to simultaneously receive said analog signal and said first referer-ence voltage for generating a first control signal indicating when said ambient light intensity corresponds to cloudy weather;

second comparator means having inputs coupled to simultaneously receive said analog signal and said second reference voltage for generating a second control signal indicating when said ambient light intensity corresponds to dusk;

timer means for generating a third control signal after a manually selectable time delay in response to the initial occurrance of said second control signal to indicate full darkness; and

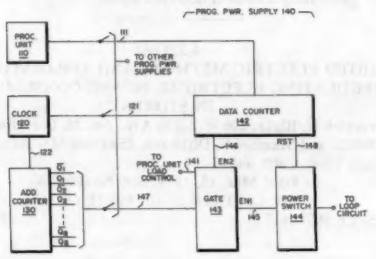
a first electromagnetic switch operable in response to said first control signal for energizing lights near windows in said store, a second electromagnetic switch operable in response to said second control signal for energizing electric signs and parking lot lights for said store, and a third electromagnetic switch operable in response to said third control signal for de-energizing a uniformly distributed portion of all interior overhead lighting in said store.

4,229,665

PROGRAMMABLE POWER SUPPLY SYSTEM

Larry M. Tiedt, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sep. 22, 1978, Ser. No. 944,826
Int. Cl.[3] H02J *7/00*
U.S. Cl. 307—150 **10 Claims**



1. A programmable power supply system for use in a digital telecommunication switching system, including a processing unit periodically operated to generate at least one loading signal and digital data representative of a selected voltage to be applied to a selected telecommunication loop circuit, said programmable power supply system comprising:

pulsing means periodically operated to generate a plurality of clock pulses;

addressing means connected to said pulsing means operated in response to said clock pulses to generate at least one address signal;

decoding means connected to said addressing means operated in response to said address signal and said loading signal to generate at least one data transfer signal;

counting means connected to said processing unit, to said pulsing means and to said addressing means operated in response to said data transfer equal to accept said digital data from said processing unit and further operated in response to a predetermined number of said clock pulses to count down from an initial count represented by said digital data to a reset position and generate a reset signal;

storage means connected to said counting means and to said addressing means operated to initiate generation of a power control signal in response to said address signal and further operated to terminate generation of said power control signal in response to said reset signal; and

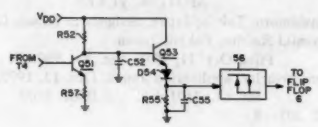
power switching means connected between said selected telecommunication loop circuit and said storage means, operated to generate power of a first characteristic in response to said power control signal and to generate power of a second characteristic in response to an absence of said power control signal and further operated to apply power equivalent to an average of said first and second characteristics, to said telecommunication loop circuit.

4,229,666

AUDIO DETECTOR CIRCUIT

Zachariah H. Milburn, Jr., Amherst, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 27, 1978, Ser. No. 946,254
Int. Cl.[3] H03K *3/29*
U.S. Cl. 307—290 **18 Claims**



1. A detector circuit comprising: input means coupled to a source of input signals; first switching means having an input coupled to the input means;

A TURNOFF time constant coupled to the output of the first switching means, said TURNOFF time constant for determining the time delay between the removal of an input signal and the corresponding change in detector output;

second switching means having an input coupled to the output of the first switching means and to the TURNOFF time constant;

a TURNON time constant, said TURNON time constant for determining the time delay between the reception of an input signal and the corresponding change in the detector output; and

a unidirectional conducting device having a first electrode coupled to the output of the second switching means and a second electrode coupled to the TURNON time constant whereby the TURNON time constant is effectively disconnected from the second switching means during the reception of an input signal and effectively connected during the removal of an input signal.

4,229,667

VOLTAGE BOOSTING SUBSTRATE BIAS GENERATOR

Gary L. Heimbigner, Anaheim, and Robert K. Booher, El Toro, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 23, 1978, Ser. No. 937,038
Int. Cl.[3] H03L *1/00;* **H03K** *3/00*
U.S. Cl. 307—297 **5 Claims**

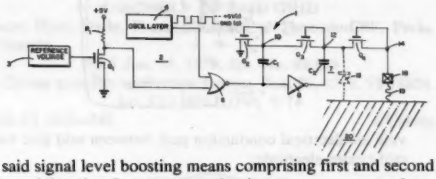
1. A substrate bias generator circuit to develop a wide range of bias voltage to compensate for threshold variations in semiconductor devices that are formed on a substrate, said bias generator circuit comprising:

transmission gate means,

level detector means responsive to an input reference voltage signal, an output terminal of said level detector means connected to an input terminal of said transmission gate means;

clock means for supplying a clock signal having first and second signal levels to another input terminal of said transmission gate means,

signal level boosting means connected between an output terminal of said transmission gate means and the substrate, said signal level boosting means increasing the output signal level of said transmission gate means to be fed back to the semiconductor devices via the substrate;



said signal level boosting means comprising first and second unidirectional current conducting means connected together in electrical series between a source of supply voltage and an electrical junction,

inverter means, the output terminal of said transmission gate means connected to an input terminal of said inverter means, and

first and second charge storage capacitance means,

said first capacitance means connected between the output terminal of said transmission gate means and a point between the connection of said first and second unidirectional current conducting means, and said second capacitance means connected between an output terminal of said inverter means and said electrical junction.

4,229,668

TRANSISTOR CIRCUIT HAVING A PLURALITY OF CMOS CIRCUITS

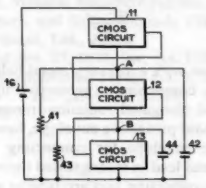
Heihachiro Ebihara, and Fukuo Sekiya, both of Tokarozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,071

Claims priority, application Japan, Jun. 24, 1977, 52-74513

Int. Cl.[2] H03K *3/353;* **H02J** *1/00*

U.S. Cl. 307—304 **8 Claims**



1. A complementary metal oxide semiconductor (CMOS) circuit for timepieces comprising:

(a) a first CMOS circuit having an oscillator circuit;

(b) a second CMOS circuit having a frequency divider circuit and connected to said first CMOS circuit;

(c) a power supply source, said first and second CMOS circuits connected in series to said power supply source;

(d) a smoothing capacitor connected between a junction of said first and second CMOS circuits and said power supply source; and

(e) a D. C. current circuit connected between the junction of said first and second CMOS circuits and said power supply source.

4,229,669

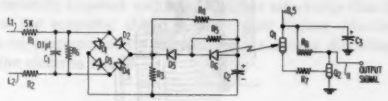
TIGHT TOLERANCE ZERO CROSSING DETECTOR CIRCUIT

Gerald L. Smith, Broomfield, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,706

Int. Cl.[2] H03K *5/153*

U.S. Cl. 307—354 **15 Claims**



1. A zero crossing circuit for producing a signal with a transition in the vicinity of, but no later than, the zero crossing point of an AC voltage comprising:

rectifying means with an input and an output coupled to said AC voltage providing at said output a rectified replica of a voltage applied at said input,

impedance means with an input coupled to the output of said rectifying means, and an output, said impedance means providing at said output a voltage lagging a voltage applied to said impedance means input, and

switching means comprising a diode coupled across said output and input of said impedance means for producing said signal as said diode is biased into conduction prior to a minimum in the output of said rectifying means by a difference in potential between said impedance means output and input said switching means producing a signal when and so long as said impedance means output exceeds said impedance means input.

4,229,670

INTEGRATED CIRCUIT HAVING FIRST AND SECOND INTERNAL CIRCUITS CONTROLLED BY A COMMON INPUT TERMINAL

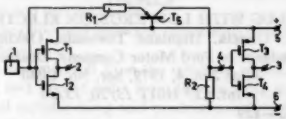
Werner F. Thommen, Hausen; Werner Fehr, and Arpad Korom, both of Zurich, all of Switzerland, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,665

Claims priority, application Netherlands, Apr. 13, 1977, 7704005

Int. Cl.[2] H03K *5/18, 3/353, 19/40*

U.S. Cl. 307—360 **12 Claims**



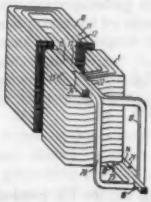
1. An integrated circuit comprising an input terminal for the application of signals to a first circuit, first and second supply lines for supplying power to said first circuit, a first transistor having first and second main electrodes that define a current path in the transistor and a control electrode for controlling the current flow in said transistor current path, means connecting the control electrode to one of the supply lines, the first main electrode to an input of a second circuit which is coupled between said first and second supply lines, and the second main electrode to said input terminal, the conductivity type of said transistor being such that the transistor cannot conduct when the voltage level at said input terminal lies between the voltages on said first and second supply lines.

4,229,671

MULTITURN COIL FOR FIELD POLES OF DYNAMOELECTRIC MACHINE

Albert Z. Lesokhin, ulitsa Chekhova, 8, kv. 22; Evelina A. Daikhovskaya, ulitsa Basseinaya, 85, kv. 202, and Ilya Z. Boguslavsky, ulitsa Ordzhonikidze, 33, kv., all of Leningrad, U.S.S.R.

Filed Apr. 22, 1977, Ser. No. 789,976
Int. Cl.[2] H02K *3/00*
U.S. Cl. 310—198 5 Claims



1. A multiturn coil assembly comprising:

outer, intermediate and inner electrically interconnected windings, having conduit means for passing of a cooling fluid therethrough,

each winding occupying a single vertical row of turns over the entire coil height, being wound with an equal number of turns stacked in the same direction as the other windings, and having first and second terminals;

said windings being concentrically arranged so that the inner peripheral dimension of said outer winding is substantially equal to the outer peripheral dimension of said intermediate winding, and the inner peripheral dimension of said intermediate winding is substantially equal to the outer peripheral dimension of said inner winding;

each winding being oriented so that said first terminals of all the windings are positioned adjacent one another and adjacent one end surface of said coil assembly, while said second terminals of all the windings are positioned adjacent one another and adjacent the other end surface of said coil assembly;

all the terminals of all the windings being directed towards only one side of the coil assembly and electrically interconnected adjacent the outer surface of said one side of the coil by means of non-intersecting connectors;

said connectors also serving as conduits for passing a cooling fluid therethrough.

4,229,672

SPARK PLUG WITH LOW EROSION ELECTRODE TIP

Edward R. Trancik, Highland Township, Oakland County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

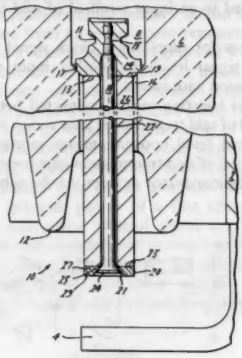
Filed Jan. 4, 1979, Ser. No. 1,040
Int. Cl.[3] H01T *13/20, 13/34*
U.S. Cl. 313—139 6 Claims

1. In a spark plug comprising:

an insulating core having an axial bore therethrough, a center electrode mounted in said bore, an outer grounding shell surrounding said insulating core and a ground electrode electrically connected to said outer shell, an improvement, including:

a thermal energy conducting sheath surrounding said center electrode within said bore; and,

an iridium disc in intimate contact with bore said sheath and said center electrode, oppositely positioned across an air gap from said ground electrode, wherein said iridium disc has a frusto-conical aperture with a smaller diameter closest to said center electrode and said center electrode has an enlarged end that extends into said aperture and is larger than said smaller diameter of said aperture to provide an electrical conduction path between said disc and said center electrode.

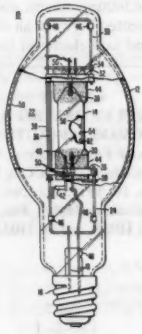


4,229,673

MERCURY METAL-HALIDE LAMP INCLUDING NEODYMIUM IODIDE, CESIUM AND SODIUM IODIDE

William A. McAllister, Morris Township, Morris County, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1979, Ser. No. 4,259
Int. Cl.[2] H01J *61/22*
U.S. Cl. 313—225 1 Claim



1. In combination with a mercury metal-halide high-intensity-discharge lamp comprising a protective light-transmitting envelope, a sealed elongated radiation-transmitting arc tube supported within said protective envelope, base means secured to said protective envelope for connecting said lamp to a source of power, and lead-in means sealed through said protective envelope for connecting said arc tube to said base means, said arc tube having electrodes spaced apart a predetermined distance and operatively positioned within said arc tube proximate the ends thereof and electrically connecting to said lead-in means, the improvement comprising:

(a) said arc tube having as a discharge-sustaining filling a small charge of inert ionizable starting gas; mercury in predetermined amount as required, when fully vaporized as the sole discharge-sustaining constituent, to provide an operating mercury vapor pressure of about 3.8 atmospheres as calculated on the basis of an average mercury vapor temperature of 2000° K.; neodymium iodide in amount of about 5×10^{-6} gram mol/cm of spacing be-

tween said electrodes; cesium iodide in amount of about 5×10^{-6} to 7.2×10^{-6} gram mol/cm of spacing between said electrodes; and the gram mol ratio of said neodymium iodide to cesium iodide being about 1:1;

(b) said arc tube also including sodium iodide in amount of about 6×10^{-6} gram mol/cm of spacing between said electrodes; and

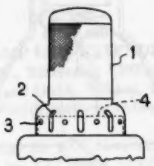
(c) finely divided phosphor carried as a coating on the inner surface of said protective envelope, said phosphor substantially comprising calcium sulfide activated by europium and sensitized by tin or lead.

4,229,674

GRID OF PYROLYTIC GRAPHITE FOR A HIGH-POWER ELECTRON TUBE AND A METHOD FOR THE ASSEMBLY OF SAID GRID

Roger Hoet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 18, 1979, Ser. No. 49,126
Claims priority, application France, Jun. 23, 1978, 78 18834
Int. Cl.³ H01J *1/46, 9/14*
U.S. Cl. 313—348 **6 Claims**



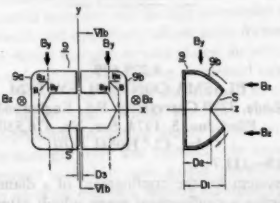
2. An electron tube grid of pyrolytic graphite which is intended to be mounted on a metal ring, the lower end of said grid being formed by a thin-walled cylindrical sleeve, wherein the sleeve is provided with a series of longitudinal slots located at uniform intervals around the periphery of said sleeve as well as a series of fixing holes located at uniform intervals between said slots, said slots being adapted to terminate at a short distance from the edge of said sleeve so as to leave a retaining portion of small height between the ends of said slots and said edge.

4,229,675

COLOR PICTURE TUBE WITH INTERNAL FUNNEL SHAPED MAGNETIC SHIELD

Takeshi Matsuki, Mobara; Koichi Maruyama, Chiba; Kuniharu Osakabe, Mobara, and Sakae Kunitoh, Chiba, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 27, 1978, Ser. No. 919,608
Claims priority, application Japan, Jul. 1, 1977, 52-77914
Int. Cl.² H01J *29/06*
U.S. Cl. 313—402 **10 Claims**



1. An in-line stripe type color picture tube comprising:

a bulb including a neck portion, a funnel portion and a panel portion for hermetically sealing a large diameter opening of the funnel portion,

an electron gun assembly disposed in the neck portion of the bulb,

a fluorescent screen formed on the inner surface of the panel portion,

a shadow mask disposed in the bulb and opposing the fluorescent screen with a predetermined spacing,

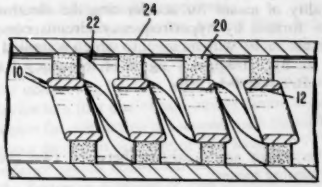
a magnetic shield member in the form of a funnel opposing the shadow mask and extending along the curvature of the funnel portion for surrounding a travel region of electron beams emitted from the electron gun assembly, said magnetic shield member having a transverse cross-sectionally central portion defining an area of a predetermined, substantially constant width and a higher reluctance than that of the magnetic shield member, said higher reluctance area perpendicularly intersecting a scanning direction of the electron beams.

4,229,676

HELICAL SLOW-WAVE STRUCTURE ASSEMBLIES AND FABRICATION METHODS

Arthur E. Manoly, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 16, 1979, Ser. No. 21,146
Int. Cl.³ H01J *25/34*
U.S. Cl. 315—3.5 **11 Claims**



1. A method for fabricating a helical slow-wave structure assembly comprising:

winding a first ribbon of an electrically conductive material unsusceptible to etching by a predetermined etchant on a cylindrical mandrel to form a first helix having a predetermined spacing between successive turns thereof;

winding a second ribbon of a material susceptible to etching by said predetermined etchant and having a width greater than said predetermined spacing about said first helix over the helical space between turns of said first helix and in overlapping relationship with portions of adjacent turns of said first helix to form a second helix;

depositing dielectric material unsusceptible to etching by said predetermined etchant over the exposed surfaces of said first and second helices;

grinding the deposited dielectric material to a predetermined radial dimension;

removing said mandrel from the resulting assembly;

removing said second helix from the resulting assembly by chemical etching using said predetermined etchant; and

mounting the resulting assembly within a tubular housing with the circumferentially outer surface of the dielectric material firmly contacting the inner surface of said housing.

5. A helical slow-wave structure assembly comprising:

a first helix of electrically conductive material coaxially disposed within a tubular housing;

a second helix of dielectric material coaxially disposed about and wound in the same sense as said first helix, said second helix being bonded to the outer circumferential surface of said first helix and extending radially outwardly therefrom into firm contact with said tubular housing; and

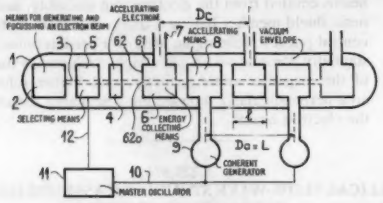
the width of at least a portion of said second helix varying gradually as a function of axial distance along said helices.

4,229,677

HIGH-POWER HYPERFREQUENCY EMISSION TUBE

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 20, 1978, Ser. No. 898,154
Claims priority, application France, Apr. 26, 1977, 77 12539
Int. Cl.[2] H01J 25/34
U.S. Cl. 315—3.6 11 Claims



1. A tube for emitting high power electromagnetic waves which comprises, in a vacuum envelope:

means for generating and focussing an electron beam;

a plurality of energy collecting means formed by circuits of the hyperfrequency type which modulate the electron beam and extract the useful energy in the form of a signal of very high frequency F;

a plurality of means for accelerating the electrons of the beam formed by hyperfrequency circuits comprising a resonant cavity with an input to which is applied in operation an hyperfrequency signal of frequency f such that $f/F=\Omega/\omega=\phi/\theta\cdot 1/ND_c$,

where:

$\Omega=2\pi f$;

$\omega=2\pi F$;

ϕ is the transit angle existing between two consecutive accelerating means;

θ is the interaction angle existing between the electron beam and the useful signal of frequency F;

D_c is the spatial period of the collecting means uniformly distributed with the accelerating means, of spatial period D_a, along the path of the electron beam and in its direction of propagation;

N is the number of collecting means comprised between two accelerating means;

the spatial period D_a of the accelerating means being equal to a whole multiple k of the spatial period D_c

of the collecting means and the accelerating means restoring to the electron beam the energy lost at the level of the collecting means.

4,229,678

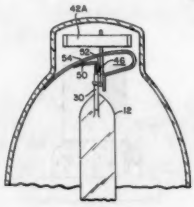
SAFETY SWITCH WHICH RENDERS HID LAMP INOPERATIVE ON ACCIDENTAL BREAKAGE OF OUTER ENVELOPE

John Petro, Belleville, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1976, Ser. No. 748,351
Int. Cl.[3] H01J 7/44, 13/46, 19/78, 23/16
U.S. Cl. 315—73 3 Claims

1. In combination with a high-intensity discharge lamp comprising an elongated radiation-transmitting arc tube having pressed-end portions which is longitudinally disposed and supported within an elongated light-transmitting protective envelope having a neck portion, a bulb portion having an inner surface and an outer surface, and a dome portion and which envelope is opaque to short wavelength ultraviolet radiations, said arc tube enclosing a discharge-sustaining filling and having electrodes operatively positioned therein proximate the ends thereof, electrical lead-in members sealed through said arc tube and connected to said electrodes, electrical adaptor means affixed to the neck portion of said envelope to facilitate electrical connection of said lamp to a source of electrical power, electrical conductor means electrically connecting said electrical adaptor means to said electrical lead-in members, said electrical conductor means including an arc tube supporting frame comprising an elongated rigid supporting means longitudinally disposed within said protective envelope and including ridig metallic members disposed generally transversely within said protective envelope and in supportive relationship with respect to the pressed-end portions of said arc tube, the improvement which comprises:

switch means having a normally open position in which said switch means is electrically non-conducting and a closed position in which said switch means is electrically conducting, said switch means included in series circuit arrangement intermediate said arc tube supporting frame and one of said lead-in members, said switch means including an electrical conductive contact member affixed to said one lead-in member which is positioned nearest said dome portion of said protective envelope, said electrical conductive contact member comprising an elongated resilient metallic member initially extending toward said



dome portion and then toward the inner surface of said bulb portion, a resilient elongated conductive contact having one end affixed to one of said rigid metallic members of said frame which is positioned nearest said dome portion, said resilient contact initially extending toward said dome portion and then toward the inner surface of said bulb portion and then retroverted toward the opposite inner surface of said bulb portion to contact the opposite inner surface of said bulb portion, said elongated metallic member and said resilient retroverted conductive contact both ultimately extend generally collinearly, and the contact of said resilient retroverted conductive contact with the inner surface of said bulb portion forces both said elongated metallic member and said resilient retroverted conductive contact into electrical contact against their resiliencies, and breakage of said protective envelope freeing said retroverted contact and permitting said retroverted contact to be moved by its resiliency out of electrical contact with said electrical conductive contact member, thereby to render said lamp inoperative.

4,229,679

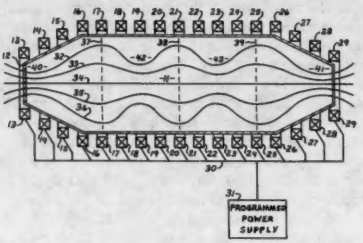
PLASMA CONTROL SYSTEM

Tenny D. Lode, 3270 Cherryridge Rd., Englewood, Colo. 80110

Filed Jun. 5, 1974, Ser. No. 476,530
Int. Cl.[2] H05H 1/10
U.S. Cl. 315—111.7 13 Claims

1. In a system for the confinement of a diamagnetic fluid, means defining a confinement space which extends generally along a central line, means generating a magnetic field at least partially parallel to said central line, means generating a plurality of local strong matnetic field confinement regions, and pumping means for pumping said diamagnetic fluid generally

along said central line relative to said local strong magnetic field confinement regions, said central line being closed upon



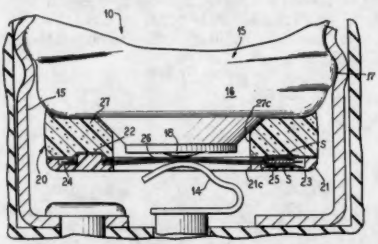
itself to form an endless path for movement of said diamagnetic fluid.

4,229,680

LAMP LIFE EXTENDER

Donald M. Berlin, Jr., McHenry; Clifford E. Mensing, Glen Ellyn, both of Ill., and Ole K. Nilssen, 1984 Caesar Dr.–Rte. 4, Barrington, Ill. 60010, assignors to Ole K. Nilssen, Barrington, Ill.

Filed May 23, 1979, Ser. No. 41,649
Int. Cl.[3] H05B *37/02*
U.S. Cl. 315—200 R **23 Claims**



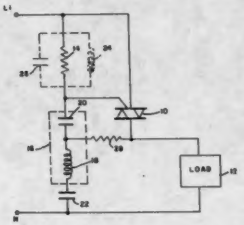
7. A device mountable about the base end of an incandescent light bulb for movement with the same into and out of a lampholder socket and operable to provide a voltage reducing circuit between the central base contacts of the light bulb and its cooperating lampholder comprising: a thin, disc-like laminated contact assembly providing the voltage reducing circuit and comprising first and second coextensively superposed, thin metal contact plates; insulator means disposed between and electrically isolating said plates, and a leaderless silicon rectifier chip mounted between and facially connected to registeringly superposed, and oppositely off-set areas formed in corresponding peripheral margins of said plates; an annular mounting base of insulator material having a recessed cavity extending inwardly of one face thereof and formed to substantially registeringly mount said contact assembly therewithin; an annular, compressible mounting gasket of insulator material disposed registeringly over and connectively secured to said base and contact assembly; said gasket having an adhesive coating over an outer end face thereof for bonding the device concentrically about the base of the light bulb so that the central base contact thereof is positioned within the open center of said gasket for operating engagement with said first contact plate.

4,229,681

FREQUENCY/SENSITIVE SWITCHING CIRCUIT

John L. Plumb, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 29, 1978, Ser. No. 974,300
Int. Cl.[3] H05B *37/02*; H04Q *1/44*
U.S. Cl. 315—244 **8 Claims**



1. A frequency sensitive switching circuit for controlling the energization of a load in response to a control signal imposed on power circuit conductors carrying operating power for the load, said control signal having a first frequency and said operating power being alternating current of a second frequency, said switching circuit comprising:

a bidirectional switching device having first and second main terminals and a control gate for controlling conductance between the terminals;

means for connecting the first main terminal of said switching device to a first one of said power circuit conductors, and means for connecting the second main terminal of said switching device to one side of said load;

an impedance means connected between the control gate and the first main terminal of said switching device;

a series resonant circuit tuned to pass the control signal and block the operating power and comprising a first capacitor means and an inductor means, said first capacitor means being connected between the control gate of said switching device and one side of said inductor means;

a second capacitor means having one terminal connected to a second side of said inductor means and having a capacitance value selected to pass the control signal and block the operating power; and

means for connecting a second terminal of said second capacitor means to both a second side of said load and a second one of said power circuit conductors, whereby said impedance means, first capacitor means, inductor means and second capacitor means are serially connected in that order across said first and second power conductors;

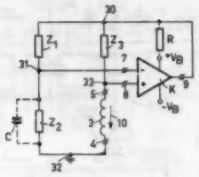
said control signal being developed across said impedance means and applied to the gate of said switching device to activate the same into conduction at the end of each half cycle of operating power, and the conduction of operating power through said switching device being operative to effectively short out said first capacitor means and cause said first inductor means to block said control signal for the remainder of the operating power half cycle, thereby reducing the consumption of control signal power;

wherein the improvement comprises a first resistor connected between the second main terminal of said switching device and the junction of said first capacitor means and said inductor means, said first resistor having a value selected sufficiently high to limit the current flowing in the gate of said switching device when said switching device is activated into conduction and sufficiently low to facilitate said shorting out of the first capacitor.

4,229,682
ELECTRONICALLY COMMUTATING MOTOR

Bernardus H. A. Goddijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 7, 1978, Ser. No. 913,305
Claims priority, application Netherlands, Aug. 30, 1977, 7709518
Int. Cl.[2] H02K *29/02*
U.S. Cl. 318—254 15 Claims

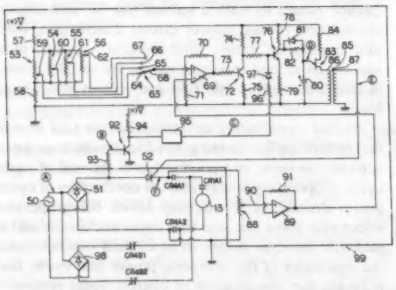


1. An elecctronically commutating motor comprising, a bridge circuit having a first impedance connected between a first point and a second point, a second impedance connected between the second point and a third point, a third impedance connected between the third point and a fourth point, and a fourth impedance connected between the fourth point and the first point, and comparator means having a first and a second input connected to the second and the fourth point, respectively, for comparing the voltages at the second and the fourth points, and having an output for energizing the bridge circuit between the first and the third points as a function of an output signal at said output of said comparator means, and wherein at least one of the first and third impedances comprises a stator phase winding of the motor.

4,229,683
DEVICE FOR CONTROLLING THE MOVEMENT OF A MOVABLE MEMBER

Kikuo Watanabe; Mitsutaka Kazino, and Hisashi Yamazaki, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 2, 1979, Ser. No. 26,551
Claims priority, application Japan, Apr. 14, 1978, 53/44640
Int. Cl.[3] G05G *5/00*
U.S. Cl. 318—466 5 Claims



1. A device for controlling the movement of a movable member on a frame comprising:

a fluid pressure means associated with the movable member for reciprocating the member in forward and backward directions;

a rack movably mounted on the frame so as to be engaged with the movable member at a predetermined position during the movement of the member in the forward direction and to be movable with the member after the engagement with the rack;

a variable speed and reversible motor operatively connected with the rack through an intermediate mechanism;

the intermediate mechanism including elements which transmit the force from the motor to the rack and interrupt the transmission of the force from the rack to the motor;

a first means for generating a signal when the movable member arrives at the predetermined position during the movement of the member in the forward direction;

a first driving circuit responsive to the signal from the first generating means for driving the motor in a predetermined direction in order to move the rack in the forward direction at a predetermined speed;

a second means for generating a signal when the movable member arrives at the end position in the forward direction;

means reponsive to the signal from the second generating means for changing the operating direction of the fluid pressure means in order to move the movable member in the backward direction;

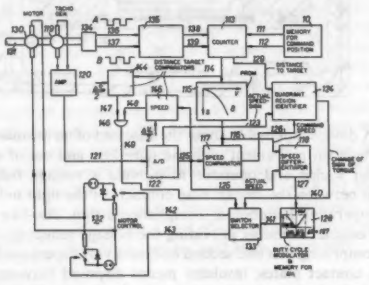
a second driving circuit responsive to the signal from the second generating means for reversing the motor in order to return the rack; and

a third means for generating a signal to make the second driving circuit de-effective when the rack returns to the predetermined position.

4,229,684
METHOD AND APPARATUS FOR TIME-OPTIMIZED POSITIONING OF AT LEAST ONE BODY IN A DESIRED TARGET POSITION

Marco Saglini, Muralto, and Walter Meier, Losone, both of Switzerland, assignors to A.G. für Industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Jul. 7, 1978, Ser. No. 922,688
Claims priority, application Switzerland, Aug. 9, 1977, 11028/77
Int. Cl.[3] G05B *13/00*
U.S. Cl. 318—561 4 Claims



1. Apparatus for time-optimizing positioning of a body at a target position (3) having a motor (130) driving the body with predetermined torque from a start position (2, 12) to the target positions (3) comprising

means (10) storing an identification of the target position (3);

means (134, 135) providing identification of an actual position of the body;

means (113) comparing the actual and target position and providing a distance-to-target signal;

means (119, 120, 122) furnishing a motor speed signal;

quadrant identification means (124) responsive to the distance-to-target signal and the motor speed signal to determine, in a Cartesian coordinate system, the direction and distance of movement of the motor;

speed-distance relation memory means (PROM, 115) storing

a curve representative of the loci on a speed-distance curve at which the motor must reverse torque, while the body is being moved to the target and requiring only a single torque reversal;

means (**117, 126**) coupled to the speed-distance relation memory means (**115**) and the motor speed furnishing means (**119, 120, 122**) and providing an output signal coupled to the quadrant region identification means (**124**) when, upon operation of the motor, the position of the body intersects the speed-distance curve stored in said speed distance relation memory means (**115**), said quadrant region identification means then providing a torque-reversal command signal;

motor control means (**132, 133**) responsive to the distance-to-target signal as well as to the torque reversal command signal and controlling the motor to provide output torque first in the direction required to bring the body to the target and then, upon receiving the torque reversal command signal, to reverse the motor torque to brake approach of the body to the target;

means (**144**) defining a target accuracy range (Δs_o) and representative of the maximum tolerance distance of positioning of the body from the target position, and furnishing a tolerance range signal;

means (**145**) defining a target speed approach range (Δv_o) representative of maximum deviation of speed of the body when its movement is controlled by the motor from a commanded speed and furnishing an approach range signal;

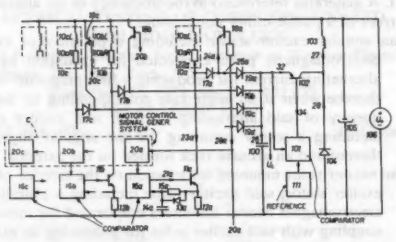
and means (**146, 122**) connected to and responsive to the tolerance range signal and the approach range signal additionally controlling the motor control means to deenergize the motor when the body is within the target accuracy range and moving at the approach range speed.

4,229,685

ELECTRICAL CIRCUIT FOR REGULATING THE CURRENT IN THE WINDINGS OF CERTAIN STEP MOTORS

Walter Meier, Losone, Switzerland, assignor to A.G. für industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Apr. 18, 1978, Ser. No. 897,513
Claims priority, application Switzerland, Apr. 19, 1977, 4832/77
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **9 Claims**



1. In a stepping motor control system, wherein the stepping motor is adapted to be connected to a source (**106**) of electrical energy, and has a plurality of windings (**10*a*, 10*b*, 10*c***)

comprising, in accordance with the invention, the circuit combination of

separate switch means (**11*a*, 11*b* . . .**) connecting when closed, a respective winding to the source;

separate switch control means (**20*a*, 20*b* . . .**) respectively connected to and controlling operation of the respective switch means;

a buffer capacitor (**100**);

coupling circuit means (**17*a*, 17*b* . . . ; 19*a*, 19*b* . . .**) respectively connected to said respective windings and to the buffer capacitor to transfer stored electromagnetic energy in the respective windings to the buffer capacitor when, after energization of a respective winding, the respective switch means is controlled to open;

and a storage circuit (**103, 104, 105**) including a main storage capacitor,

with

charge sensing means (**101, 111**) connected to the buffer capacitor (**106**) and sensing when the charge accumulated thereon has reached a predetermined value;

and connecting circuit means including transfer switch means (**102**) controlled by the charge sensing means, interconnecting the buffer capacitor (**100**) and the storage circuit (**103, 104, 105**),

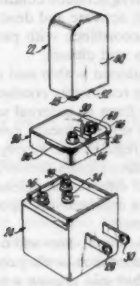
the charge sensing means controlling the transfer switch means (**102**) to close when the charge on the buffer capacitor (**100**) has reached the predetermined value to transfer at least a portion of the charge thereon to the main storage capacitor (**105**), the charge sensing means controlling the transfer switch means to open when the charge level in the buffer capacitor has dropped, so that the buffer capacitor can then receive additional energy from the respective windings while being isolated from the storage circuit.

4,229,686

BATTERY CHARGER ADAPTER SYSTEM

Ferdinand H. Mullersman, and Billy E. Stillwell, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Feb. 13, 1978, Ser. No. 877,297
Int. Cl.³ H01M *10/46*
U.S. Cl. 320—2 **19 Claims**

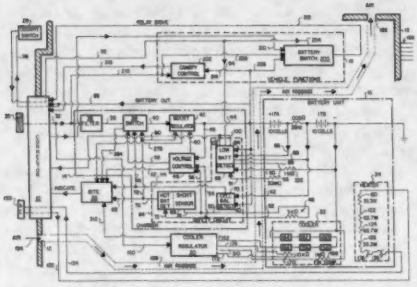


1. In a charging system for secondary batteries having a housing containing a source of charge current including a secondary winding with first, second and third source terminals, said first and third source terminals connected to said winding, said second source terminal connected to said winding at a point intermediate of the connections of said first and third source terminals to said winding; and a secondary battery having positive and negative terminals, the improvement comprising: an adapter module comprising housing means having first and second terminals removably connectable to said first and third source terminals and having third and fourth terminals removably connectable to said positive and negative battery terminals, means electrically interconnecting said first and second adapter terminals with said third and fourth adapter terminals, respectively, and means for detachably securing said adapter housing means to said source housing and said battery.

4,229,687
TEMPERATURE MAINTAINED BATTERY SYSTEM

William A. Newman, Salt Lake City, Utah, assignor to Utah Research & Development Corporation, Salt Lake City, Utah

Filed May 7, 1979, Ser. No. 36,363
Int. Cl.[3] H02J 7/00; H05K 7/20
U.S. Cl. 320—2 25 Claims



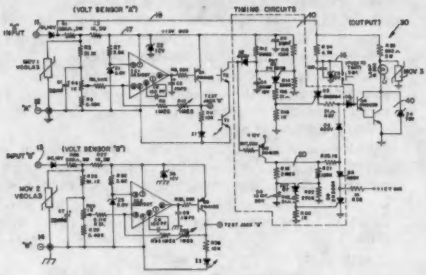
1. A battery system comprising:
a chassis;
a battery positioned within said chassis and removably conductively connectable to an external direct current load;
a battery charger positioned within said chassis and removably conductively connectable to an external source of direct current power and conductively connected to said battery, said charger having means to automatically selectively charge said battery when said battery is in a preselected state of discharge;
heater means positioned within said chassis and removably conductively connectable to an external source of power, said heater means including heater element means and switch means, said switch means being conductively connected to said external AC source and said heater element means and operative between conductive and nonconductive conditions to activate and deactivate said heater element means in accordance with preselected temperature conditions within said chassis;
cooling means positioned within said chassis comprising:
a cooler regulator removably conductively connectable to receive power from an external source,
first temperature sensing means conductively connected to said cooler regulator to supply chassis interior temperature reflective signals thereto,
at least one peltier effect cooler element positioned within said chassis and conductively connected to said cooler regulator, wherein
said cooler regulator activates and deactivates said cooler element in accordance with preselected temperature conditions within said chassis sensed by said temperature sensing means, and
heat removal means associated with said cooler element to transfer heat from interior to exterior said chassis.

4,229,688
BATTERY DISCHARGE INDICATOR

Raymond L. Knox, Bluefield, Va., and Charles D. Lindsay, Mansfield, Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Sep. 5, 1978, Ser. No. 939,403
Int. Cl.[3] H02J 7/00; H01M 10/48
U.S. Cl. 320—48 18 Claims

1. A battery charge condition indicator circuit for a plurality of battery supply sources for an electrically powered mining vehicle, comprising:
(a) circuit means for automatically and separately monitoring the charge condition of said plurality of battery supply sources, said circuit means having a first monitoring operation for determining when any of said plurality of battery supply sources discharge to a predetermined discharge level and a second monitoring operation for determining when said plurality of battery supply sources are charged to a predetermined charge level; and

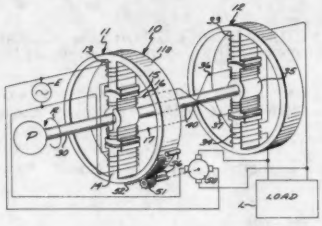


(b) indicating circuit means including means responsive to said first monitoring operation to provide a continuously flashing indication and further including means responsive to said second monitoring operation to provide a momentary flashing indication.

4,229,689
AC SYNCHRONIZED GENERATOR

Leo G. Nickoladze, 91969 Kalapu St., Ewa Beach, Hi. 96706

Filed Nov. 5, 1979, Ser. No. 88,161
Int. Cl.[3] H02P 9/42, 9/48
U.S. Cl. 322—32 1 Claim



1. A generator referenced to the frequency of the alternating current of a public utility comprising:
an annular exciter stator including a plurality of exciter electromagnetic poles connected for excitation by said alternating current for producing a first magnetic vector therebetween at an angle rate corresponding to the frequency of said alternating current, said exciter stator including a rotary mounting for the angular alignment thereof and an arcuate rack formed on the exterior;
an exciter rotor mounted for rotation on the interior of said exciter stator, said exciter rotor including a plurality of electromagnet exciter inductors conformed for inductive coupling with said exciter poles for producing an excited current thereon of a phase and frequency corresponding to the summation of said angular rate of said first magnetic vector and the rotational rate of said exciter rotor;
a generating rotor connected for common rotation with said exciter rotor, said generating rotor including a plurality of electromagnetic generating inductors corresponding to said exciter inductors and connected in opposite alignment therewith, said generating inductors being displaced in angle relative said exciter inductors whereby a second magnetic vector of opposite angular rate to that of said exciting current is produced by said generating inductors;
an angular generating stator mounted in surrounding relationship around said generating rotor, said generating

stator including a plurality of electromagnetic generating poles aligned for electromagnetic induction by the advance of said magnetic vector on the interior thereof;

power means connected for angular advancement of said exciter and generating rotor;

a servo motor connected for engagement with said rack for angular advancement of said stator; and,

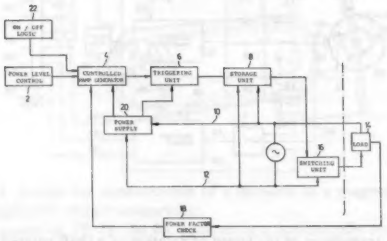
phase comparing means connected to said alternating current, and the signal induced on said generating poles for advancing said servo motor in rotation according to the phase difference therebetween.

4,229,690

SINGLE PHASE POWER CONTROL CIRCUIT

Benjamin Avidan, Bat Yam, Israel, assignor to Techno-Instruments Ltd., Tel-Aviv, Israel

Filed Apr. 3, 1978, Ser. No. 892,695
Claims priority, application Israel, Apr. 20, 1977, 51917
Int. Cl.³ G05F *5/00*
U.S. Cl. 323—24 **9 Claims**



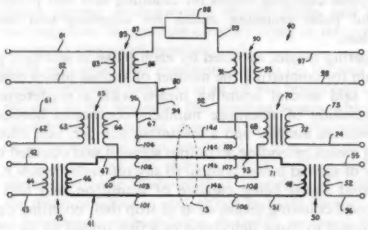
1. A closed loop single phase continuous A.C. power control circuit for controlling the power to a load comprising an input connectable to a source of A.C., a power level output control, a load power factor signal producing means and a power storage unit connected in parallel across said A.C. source, said power storage unit being controlled in use to provide power to a load in accordance with the setting of said power level output control and the load power factor signal.

4,229,691

ELECTRICAL TESTING OF CORDS TERMINATED WITH MODULAR PLUGS

Robert P. Loesch, Omaha, Nebr., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,632
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **16 Claims**



1. A method of testing electrical characteristics of a cable having a plurality of conductors, said method comprising the steps of:

establishing a first series loop to include one of said conductors;

establishing a second series loop which is isolated from said first loop to include another one of said conductors which is adjacent said one conductor that is included in said first loop;

connecting one side of a test voltage source transformer to the first loop and the other side of said test voltage source transformer to a detector transformer and then to said second series loop; and

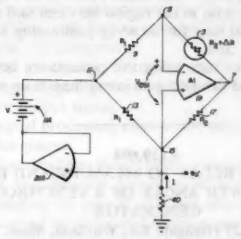
causing a test voltage to be impressed across the source transformer and between the conductor in said first loop and the conductor in said second loop with test voltage breakdown between adjacent conductors in the first and second loops causing current to flow through the detector transformer to provide an output reading which is indicative of a breakdown between said adjacent conductors.

4,229,692

LINEAR LOW DRIFT BRIDGE AMPLIFIER

Jerald G. Graeme, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Oct. 25, 1978, Ser. No. 954,341
Int. Cl.³ G01R *27/02*
U.S. Cl. 324—62 **10 Claims**



1. A bridge amplifier circuit for linearly amplifying a transducer deviation signal produced by variations in resistance of a transducer of a transducer bridge, said transducer bridge including first, second, third, and fourth nodes, said transducer being connected between said second and third nodes, first resistance means being connected between said second and fourth nodes, second resistance means being connected between said fourth node and said first node, third resistance means being connected between said first node and said third node, a power supplying conductor being connected to said fourth node, said bridge amplifier circuit comprising in combination:

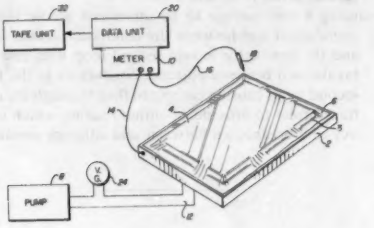
a. first amplifier means having a positive input, a negative input, and an output coupled to said first, second, and third nodes, respectively, for producing an increased or decreased current through said third resistance means in response to a positive variation in said transducer resistance or a negative variation in said transducer resistance, respectively, said increased or decreased current in said third resistance means acting to maintain said transducer bridge in a balanced voltage condition; and

b. constant current maintaining means coupled between said first node and said fourth node for maintaining constant current in said first and second resistance means, whereby current flowing into or out of said bridge amplifier circuit through said first node is linearly related to said variations in resistance of said transducer.

4,229,693
METHOD AND APPARATUS FOR CAPACITANCE TESTING PRINTED CIRCUIT BOARDS

Dan F. Irick, Glendale, and Roger F. Zollinger, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Nov. 24, 1978, Ser. No. 963,638
Int. Cl.[3] G01R 15/12
U.S. Cl. 324—73 PC 9 Claims

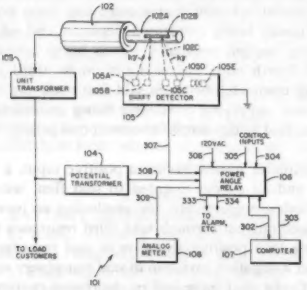


1. An apparatus for testing printed circuit boards having electrical interconnects therein, comprising:
- a metal base for supporting the printed circuit board to be tested;
- a plastic film disposed over said printed circuit board and coupled to said metal base;
- first means coupled to said metal base via said aperture for creating a vacuum in the region between said plastic film and said metal base for securely positioning said printed circuit board; and
- second means for measuring the capacitance between said metal base and the electrical interconnects on said printed circuit board.

4,229,694
POWER ANGLE RELAY TO MEASURE AND RESPOND TO THE POWER ANGLE OF A SYNCHRONOUS GENERATOR

Gerald L. Wilson, 29 Highgate Rd., Wayland, Mass. 01778, and David M. Otten, 50 Playstead Rd., Newton, Mass. 02166

Filed Aug. 7, 1978, Ser. No. 931,739
Int. Cl.[3] G01R 31/00; H02H 7/06
U.S. Cl. 324—158 MG 43 Claims

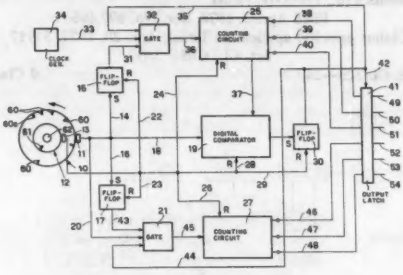


1. A power angle relay to protect a synchronous alternator, that comprises, in combination, means to receive a reference voltage from some point in the power system to which the alternator is normally synchronized and an electric signal representative of the angular position of the shaft of the synchronous alternator and operable to combine the two to provide a power-angle signal representative of the power angle between the direct axis of the synchronous alternator and the reference voltage, means to process said power-angle signal to derive therefrom a measure of the power angle, means to compare the power angle with predetermined limits thereof, and means to provide an indication only in the event that the power angle exceeds the predetermined limits a plurality of successive times.

4,229,695
ROTATIONAL SPEED TRANSDUCER HAVING GREATER LOW SPEED DISCRIMINATION

Aldo Bassi, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Mar. 14, 1978, Ser. No. 886,438
Claims priority, application Italy, Mar. 16, 1977, 21309 A/77
Int. Cl.[2] G01P 3/48; G04F 10/04
U.S. Cl. 324—166 5 Claims



1. A transducer of the speed of rotation of a shaft rotated at a speed which can vary within a determined range of values intended to be subdivided into a preselected number of zones represented by respective zone limit values having increments which increase according to a predetermined function as the magnitude of the speed increases, each zone being further subdivided into a preselected number of intervals represented by respective interval limit values having increments which increase according to another predetermined function as the magnitude of the speed increases, so that the transducer has a degree of discrimination which is greater at low speed values than at high speed values, said transducer comprising:
- first pulse generating means, operatively connected to the rotary shaft, for generating, at every revolution of the shaft, a train of first pulses in number at least equal to the number of the zones into which is subdivided the range of variation of the speed and having spacings which increase as according to said first predetermined function as the increments of said zone limit values increase and are also variable with the speed of rotation of the same shaft;
- second pulse generating means for generating second constant frequency pulses;
- first pulse counting means for counting said first pulses;
- second pulse counting means for counting said second pulses;
- comparing means, actuated by each pulse in said first pulse train for comparing the number of second pulses counted by said second counting means with a predetermined succession of reference numbers comprised between a minimum number and a maximum number, said comparing means providing an output signal if said counted number of second pulses is equal to any reference number, said output signal being capable of acting on said first and second counting means so as to stop their counting operation and to cause delivering of a first digital signal corresponding to the number of first pulses counted by said first counting means and representative of the zone of the speed zone in which the instantaneous speed value of the rotary shaft is comprised and, respectively of a second

digital signal corresponding to the number of second pulses counted by said second counting means and representative of the interval of the zone of the speed range in which the instantaneous value of the speed of the rotary shaft is comprised; and

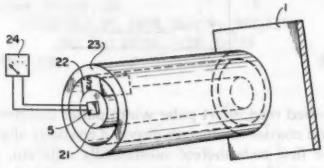
resetting means for resetting said first and second counting means and said comparing means at the end of each revolution of the shaft.

4,229,696

SENSOR FOR MEASURING MAGNETIC FIELD CHANGES

Adolf G. Gustafson, Musseronvägen 18, 141 46 Huddinge, Sweden

Continuation-in-part of Ser. No. 839,901, Oct. 6, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,807
Claims priority, application Sweden, Oct. 12, 1976, 7611326
Int. Cl.[3] G01B *7/14*; G01R *33/06*
U.S. Cl. 324—207 **20 Claims**



1. Sensor for measurement of a distance to a magnetically conductive object comprising:

means (2; 22; 19, 20) for generating a substantially constant magnetic flux, said magnetic flux generating means including a permanent magnet having north and south poles which are disposed on an axis substantially parallel to the surface of an object (1) the distance to which is to be measured;

magnetic flux guiding means including at least two magnetically conductive magnetic flux guiding members (3, 4; 21, 23) magnetically coupled to said magnetic flux generating means (2; 22) and arranged in the vicinity of said object (1), said magnetic flux guiding means having an end at least adjacent said object (1) and an end remote from said object (1);

said magnetic flux generating means being arranged to provide a first magnetic field passing through said object (1) and a second magnetic field which is directed away from the object (1) and which does not pass through said object (1), said magnetic flux guiding means guiding said first and second magnetic fields in two directions which are mutually opposed by substantially 180°;

an outer magnetically conductive member (15'; 23; 25) surrounding said magnetic flux generating means and at least one of said magnetic flux guiding members to shield said sensor against environmental electric fields, said at least one magnetic flux guiding member being an integral uninterrupted elongated member; and

a single magnetic field measuring means (5) located in said second magnetic field and in an air gap positioned close to the end of the magnetic flux guiding means which is located remote from said object (1) so as to substantially not be influenced by heat generated in the vicinity of said object, said first and second magnetic fields varying in mutually inverse relationship as a function of variation in the distance between said object and said sensor;

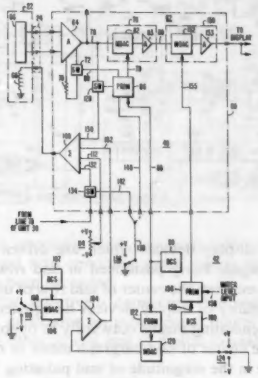
said permanent magnet being slideably mounted between said at least two magnetic flux guiding members, whereby the position of said permanent magnet relative to said magnetic flux guiding members determines the measuring sensitivity of the sensor.

4,229,697

MAGNETOMETER INSTRUMENTATION WITH DIGITALLY CONTROLLED RANGE CHANGING

Kenneth J. Petrosky, Glen Burnie, and James H. Wilson, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 20, 1978, Ser. No. 962,508
Int. Cl.[2] G01R *15/08, 33/00*; G01V *3/00*
U.S. Cl. 324—244 **14 Claims**



1. A magnetometer instrumentation for an array of magnetomer assemblies, each having a magnetometer detector and a compensation coil comprising:

(a) a signal processing circuit for each said assembly and including a signal processing channel for processing the detector output signal;

(b) said signal processing channel including first and second amplifier means;

(c) said first amplifier means being operatively connected to receive said detector output signal and including means for changing the gain of said first amplifier means;

(d) said second amplifier means being operatively connected to receive (i) the output signal of said first amplifier means and (ii) a digital input signal and being operative to modify said first amplifier signal as a function of said digital input signal;

(e) first digital memory means for providing said digital input signal and having a plurality of addressable storage locations;

(f) first means for addressing specific memory locations in said first digital memory means to provide specific ones of said digital input signals in accordance with a particular desired gain range of said signal processing channel; and

(g) circuit means for supplying said compensation coil with a current to create a magnetic field in opposition with the earth's magnetic field at the assembly location so as to null said detector.

4,229,698

TUNING INDICATOR

James A. Scharfe, Jr., 1960 La France, South Pasadena, Calif. 91030

Filed Mar. 26, 1979, Ser. No. 24,264
Int. Cl.[2] H04B *1/16*
U.S. Cl. 375—88 **49 Claims**

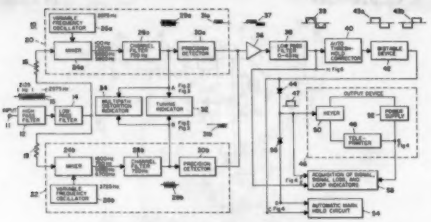
1. An indicator for visually displaying a pulsating DC signal comprising:

means for selectively generating a plurality of separate output signals each in response to the pulsating DC signal, each output signal being generated so long as the magnitude of the pulsating DC signal is within one of a plurality

of corresponding segments of a predetermined range of signal level;

a plurality of discrete display devices which emit light when energized by an electrical signal, said plurality of display devices positioned in a row to form a meter; and

means for coupling each output signal from said generating means to a pair of said discrete display devices, each said



pair of display devices which are driven by the same output signal being positioned in said row substantially equidistant from the center of said row of display devices, said plurality of display devices being energized by said single generating means outwardly in opposite directions from the center of said bargraph meter in response to an increase in the magnitude of said pulsating DC signal.

4,229,699

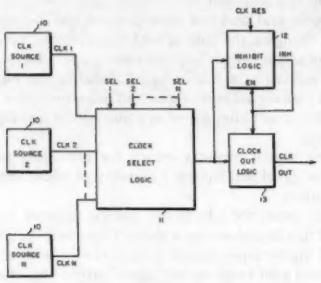
MULTIPLE CLOCK SELECTION SYSTEM

John M. Frissell, Dracut, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed May 22, 1978, Ser. No. 908,115

Int. Cl.³ H03K *1/17*

U.S. Cl. 328—63 **10 Claims**



1. Clock signal selection circuitry comprising

means for providing at least two input clock signals, each having a different clock rate;

means for selecting one of said at least two input clock signals;

means responsive to said selected input clock signal for supplying an output clock signal corresponding to said selected input clock signal;

single delay means responsive to said selected input clock signal for inhibiting the supplying of said output clock signal for a selected time period after a different one of said at least two input clock signals has been selected by said selecting means;

said output clock signal supplying means being responsive to a newly selected input clock signal for supplying, after said selected time period, an output clock signal corresponding to said newly selected input clock signal.

4,229,700

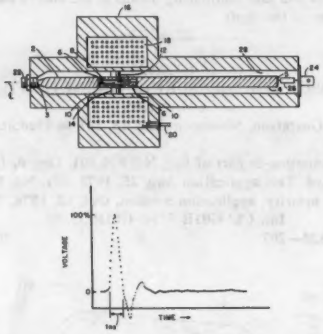
BURIED REED, EXTRA-SHORT PULSE WIDTH PULSER

Hugh W. Greene, P.O. Box 8, Sommerville, Ala. 35670

Filed Nov. 27, 1978, Ser. No. 964,003

Int. Cl.³ H03K *5/06, 3/02, 3/45, 3/53*

U.S. Cl. 328—65 **9 Claims**



1. A buried reed, short pulse width pulser comprising: first and second coaxial conductors disposed coaxially aligned with respective first ends thereof substantially adjacent, coupling means electrically connected between respective first ends of said coaxial conductors for controllably providing an electrical path therebetween, gating means coaxially disposed circumferentially around said coupling means and said conductor ends for controllably activating said coupling means, cylindrical housing means encompassing said gating means, coupling means, and coaxial conductors, said housing means being electrically conductive, first and second connecting means, said first connecting means being coupled to the second end of said second conductor for providing electrical coupling external to said housing, said second connecting means being coupled to the second end of said first conductor for providing output coupling from said conductor external to said housing.

4,229,701

PULSE ORDER RECOGNITION CIRCUIT

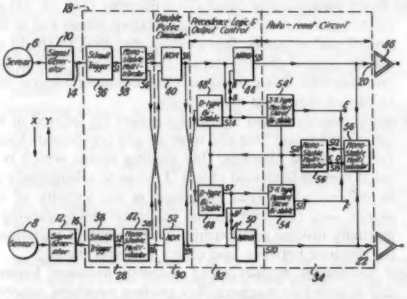
Malcolm S. Bourner, Maidstone, England, assignor to Kent County Council, Maidstone, England

Filed Apr. 27, 1978, Ser. No. 901,012

Claims priority, application United Kingdom, Apr. 29, 1977, 18149/77

Int. Cl.³ H03K *5/22*

U.S. Cl. 328—10 G **11 Claims**



1. A pulse order recognition circuit having a quiescent condition and comprising first and second inputs for receiving when the circuit is in said quiescent condition respective ones

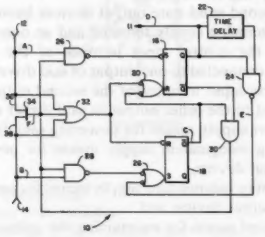
of two electrical pulses displaced relative to each other in time, at least one output, means for providing at said output an output signal in response to the earlier of said pulses being received at said first input and the later of said pulses being received at said second input, means for preventing said output signal from being provided at said output in response to the earlier of said pulses being received at said second input and the later of said pulses being received at said first input, said providing means and said preventing means being adapted to so operate irrespective of whether the two pulses overlap in time, or not, and means responsive to said later pulse for resetting the circuit to said quiescent condition ready to receive a further two said pulses.

4,229,702

CIRCUIT FOR DETECTING THE RELATIVE OCCURRENCE OF ONE SIGNAL AMONG A PLURALITY OF SIGNALS

James W. Thomas, Jr., Valparaiso, Ind., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 27, 1978, Ser. No. 955,727
Int. Cl.[2] H03K *5/20, 5/159*
U.S. Cl. 328—110 **9 Claims**



1. A circuit for detecting the relative time of occurrence of one signal among a plurality of signals and generating a control signal in response to the occurrence first of a first one of the signals, each signal being connected to at least one of a plurality of circuit inputs, the circuit includes means responsive to the level of said first signal for generating the control signal, means responsive to the occurrence of a second one of said plurality of signals for inhibiting the control signal generating means in response to the subsequent occurrence of said first signal, the improvement.

characterized by:

means responsive to the occurrence of either of said first or said second signals for providing a conductive path between said first signal input terminal and said second input terminal.

4,229,703

ZERO REFERENCE AND OFFSET COMPENSATION CIRCUIT

Raphael Bustin, Rockport, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

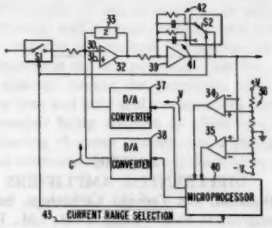
Filed Feb. 12, 1979, Ser. No. 11,358
Int. Cl.[3] H03K *5/00*
U.S. Cl. 328—162 **6 Claims**

1. A zero reference and offset compensation circuit adapted to compensate for zero reference and offset errors in an operational amplifier operating in the inverting mode, comprising:

comparison means for comparing the zero condition signal output of said operational amplifier with representations of lower and upper boundary signal levels;

a pair of digital-to-analog converters having their respective analog outputs connected through appropriate scaling networks to the inverting input terminal and to the non-inverting input terminal of said operational amplifier to correct, respectively, for current drift and voltage drift;

means connected to the output of said comparison means for generating an incremented digital signal whenever said comparison means indicates said zero condition signal output exceeds either boundary signal level, said incremented digital signal being incremented either up or down



to drive an associated D/A converter either up or down to bring said zero condition signal within the boundary which has been exceeded;

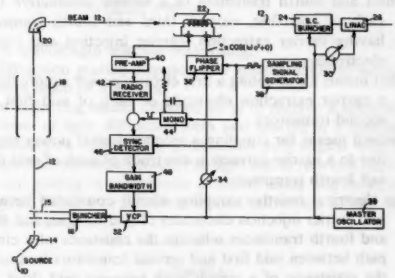
and means for selectively connecting the output of said means for generating an incremented digital signal with one or the other of said pair of digital-to-analog converters.

4,229,704

METHOD AND MEANS FOR MEASUREMENT AND CONTROL OF PULSED CHARGED BEAMS

Robert N. Lewis, Clarendon Hills, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 15, 1979, Ser. No. 3,561
Int. Cl.[2] H01J *23/34*
U.S. Cl. 328—233 **2 Claims**



1. A method of controlling time separation of adjacent bunches of charged particles in a beam of bunched charged particles comprising the steps of:

exciting a resonant circuit in response to passage nearby of a bunch of charged particles to generate a signal voltage;

generating an ac signal at a frequency near resonance of the resonant circuit;

reversing the phase of the ac signal periodically at a low frequency that is below the frequency of the ac signal to generate a phase-flipped reference signal;

adding the phase-flipped reference signal to the signal voltage to obtain a summed voltage;

amplifying the summed voltage;

detecting an envelope of the summed voltage at the low frequency;

gating the envelope to eliminate transient voltages generated by reversing the phase of the ac signal;

detecting the gated envelope to obtain an error signal pro-

portional to phase of the signal voltage with respect to phase of the reference signal, and

applying the error signal to control timing of bunches to maintain a phase of the phase-flipped reference signal, whereby the time separation of adjacent bunches is synchronized to the ac signal.

4,229,705

DIFFERENTIAL AMPLIFIERS

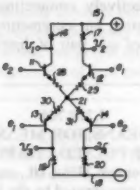
Susumu Takahashi, and Tadaaki Chikashige, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,905

Claims priority, application Japan, Aug. 31, 1977, 52/103563

Int. Cl.[2] H03F *3/45, 3/04*

U.S. Cl. 330—258 **6 Claims**



1. A transistor differential amplifier comprising:

first and second transistors of a first conductive type;

third and fourth transistors of a second conductive type, each of said first, second, third and fourth transistors having carrier extraction, carrier injection and control electrodes;

first means for coupling a first electric power supply line to a carrier extraction electrode of each of said first and second transistors;

second means for coupling a second electric power supply line to a carrier extraction electrode of each of said third and fourth transistors;

an electrical resistive coupling circuit connected between said carrier injection electrodes of said first, second, third and fourth transistors wherein the resistance of a circuit path between said first and second transistors is equal to the resistance of a circuit path between said third and fourth transistors, and the resistance of a circuit path between said first and third transistors is equal to the resistance of a circuit path connecting between said second and fourth transistors,

said resistive coupling circuit comprising four resistors connected to a common connection point and connected to said carrier injection electrodes of first to fourth transistors, respectively;

input signal applying circuits coupled with said control electrodes of said first, second, third and fourth transistors; and

at least two output terminals, with one of said output terminals connected to said carrier extraction electrode of said first transistor and the other of said output terminals connected to said carrier extraction electrode of one of said third and fourth transistors whereby a differential signal may be obtained at said output terminals with different DC levels.

4,229,706

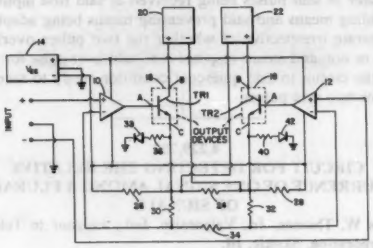
AUDIO AMPLIFIER

James W. Bongiorno, 1230 N. Horn St., North Hollywood, Calif. 90069

Filed Jan. 5, 1979, Ser. No. 1,225

Int. Cl.[3] H03F *3/26*

U.S. Cl. 330—272 **13 Claims**



1. A solid-state amplifier, comprising:

driver means for amplifying an input signal, said driver means having two outputs;

first and second solid-state output devices having a control input terminal, a supply terminal and an output terminal, wherein the control input terminal of the first output device is connected to one output of said driver means and the control input terminal of the second output device is connected to the other output of said driver means;

driver power supply means for powering said driver means;

first floating independent supply means for powering said first output device;

second floating independent supply means for powering said second output device; and

passive control means for maintaining the quiescent value of the control input current to said first and second output devices at a constant, predetermined level despite temperature variations in the output devices.

4,229,707

AUTOMATIC GAIN CONTROL CIRCUIT

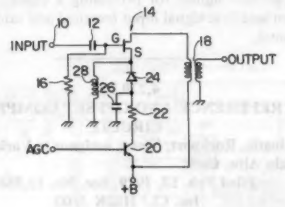
Hisashi Suganuma, Kawagod, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 1, 1978, Ser. No. 930,116

Claims priority, application Japan, Aug. 1, 1977, 52-81552; Aug. 10, 1977, 52-95814

Int. Cl.[2] H03F *3/16;* H03G *3/30*

U.S. Cl. 330—277 **4 Claims**



1. An automatic gain control circuit comprising:

(a) preamplifier means having a first active device responsive to a high frequency input signal for amplifying said high frequency input signal and for providing said amplified high fequency input signal as an output signal; and

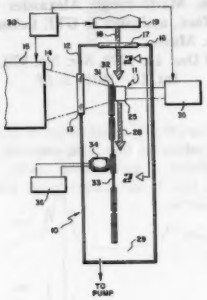
(b) supply voltage means responsive to an automatic gain control signal for providing a supply voltage in accordance with said automatic gain control (AGC) signal to said first active device having a direct current component

substantially equal to the direct current component of the signal present on the input side of said first active device, said supply voltage means including an inductor connected between said supply voltage provided to said first active device and electric ground so that the direct current component of said supply voltage provided to said first active device is grounded.

4,229,708
X-RAY LASER

Siva A. Mani, Burlington; Howard A. Hyman, Belmont, and Jack D. Daugherty, Winchester, all of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Apr. 8, 1977, Ser. No. 785,902
Int. Cl.[2] H01S *3/22*
U.S. Cl. 331—94.5 G **19 Claims**

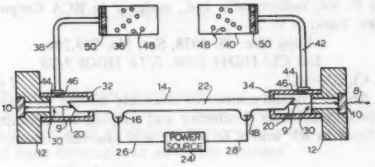


1. A laser comprising:
(a) a vacuum environment;
(b) a working region within said vacuum environment wherein a population inversion may be produced in an active medium;
(c) means for providing within said working region an active medium consisting substantially only of an atomic vapor, the constituents of which have the configuration $1s^2$ 2s;
(d) means for photoionizing said active medium to selectively produce a population of ions in an excited 1s 2s metastable state; and
(e) laser means having a pumping laser beam directed into said working region effective to antistokes Raman pump said ions, said pumping laser beam producing traveling wave stimulation in said ions to cause said ions to emit photons at a wavelength λ and produce an output laser beam at said wavelength λ substantially only in the direction of said traveling wave stimulation.

4,229,709
LASER DEVICE

William H. McMahan, 1467 Penrose Dr., Salt Lake City, Utah 84122

Filed Jun. 12, 1978, Ser. No. 915,058
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 T **8 Claims**

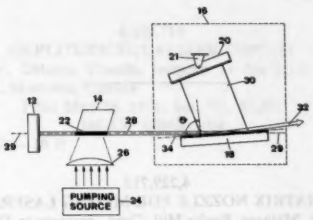


1. In a laser of the type wherein the resonant cavity is characterized by a gap-space between the gain medium and the optical mirror at each end of said cavity and wherein each said gap-space is enclosed by a gap-space chamber subject to fluctuating temperature, the improvement which comprises means for removing gaseous or vaporous contaminants including water vapor, organic vapors and ozone from the areas within a said gap-space chamber with said means being comprised of: at least one canister having its interior interconnected by a tubular conduit with the interior of at least one said gap-space chamber and wherein said canister contains solid particles of a chemical agent capable of removing the gaseous or vaporous contaminants present in the said gap-space chamber, said agent comprising a material having the properties of a molecular sieve adapted to trap and hold said contaminants and with said canister and conduit being adapted to effect in conjunction with said fluctuating chamber temperature a pumping action and flow of said contaminants from said chamber to said canister.

4,229,710
WAVELENGTH SELECTOR FOR TUNABLE LASER

Itamar Shoshan, 7 Maimon St., Haifa, Israel (32584)

Filed Jul. 3, 1978, Ser. No. 921,830
Claims priority, application United Kingdom, Oct. 21, 1977, 44006/77
Int. Cl.[3] H01S *3/08*
U.S. Cl. 331—94.5 C **15 Claims**



1. A wavelength selector comprising:
a diffraction grating disposed at a grazing angle to an incident beam of light; and
first reflecting means disposed so as to receive a dispersive beam of light diffracted from said grating at a non-zero diffraction order along a reflection path angled with respect to said incident beam of light and to reflect it back to said grating in an opposite direction along said reflection path, thereby to provide a second diffraction of said incident beam.

4,229,711
METAL DIHALIDE PHOTODISSOCIATION CYCLIC LASER

Erhard J. Schimitschek; John E. Celto, both of San Diego, and John A. Trias, La Mesa, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1978, Ser. No. 936,289
Int. Cl.[3] H01S *3/091, 3/14*
U.S. Cl. 331—94.5 P **15 Claims**

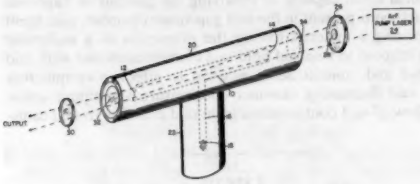
1. A pulsed, wavelength tunable, laser producing emitted laser energy by photon impact dissociation of metal dihalides and their cyclic recombination comprising:
a sealed enclosure;
a metal dihalide selected from sub-group II-B of the periodic table of elements and contained within said enclosure;
a source of photon energy disposed in proximity to said sealed enclosure for focusing a photon energy beam on said metal dihalide and for causing dissociation of said metal dihalide;

a heat source for maintaining said metal dihalide in a vaporized state;

an inert buffer gas contained within said sealed enclosure; and

a reflective surface and a partially reflective surface disposed in alignment with the principal axis of said sealed enclosure for producing optical resonance of the emitted laser energy;

such that following said dissociation of said metal dihalide by said photon energy beam, cyclic recombination of said dissociated metal dihalide occurs to produce said metal dihalide.



4,229,712

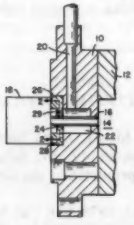
MATRIX NOZZLE FOR MIXING LASERS

Richard A. Meinzer, Rocky Hill, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 16, 1978, Ser. No. 961,334

Int. Cl.[3] H01S *3/02*

U.S. Cl. 331—94.5 D **5 Claims**



1. A matrix nozzle for mixing lasers comprising a body having a plenum chamber therein, a housing connected to said body on one side, an optical cavity connected on the other side of said housing, a tube mounted in said housing and having a passage therein, said passage interconnecting said plenum chamber and said optical cavity for directly supplying a primary gas stream from said plenum chamber to said optical cavity, flow passage means in said housing and surrounding said tube, and an opening in said housing defining a passage surrounding said tube and connecting said flow passage means to said optical cavity, said opening having an axis that is symmetrical with the axis of said tube passage for supplying a secondary gas stream to the optical cavity.

4,229,713

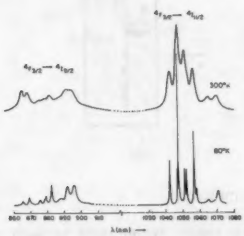
STOICHIOMETRIC RARE EARTH LASER MATERIAL AND LASER BASED THEREON

Bill C. McCollum, Marlborough; Alexander Lempickt, Wayland, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 14, 1978, Ser. No. 970,054

Int. Cl.[3] H01S *3/14*

U.S. Cl. 331-94.5 **15 Claims**



1. An active laser medium comprising a stoichiometric single crystal compound of the general forumula:

$$K_5Nd_xM_{(1-x)}Li_2F_{10} \quad (0<x<1)$$

where M is a metal selected from the group consisting of lanthanum, cerium, and gadolinium.

4,229,714

RF CONNECTOR ASSEMBLY WITH PROVISION FOR LOW FREQUENCY ISOLATION AND RFI REDUCTION

John P. Yu, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

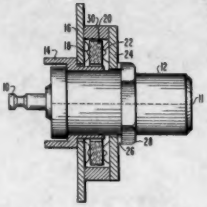
Filed Dec. 15, 1978, Ser. No. 969,780

Int. Cl.[2] H03H *7/04, 7/14;* H04B *3/28*

U.S. Cl. 333—12 **7 Claims**

1. An RF coaxial connector assembly having an inner conductor and an outer conductor and adapted for coupling signals from an RF source to a load, said assembly comprising:

a transformer having a primary and a secondary winding, said transformer primary winding being adapted for connection to said RF source and said secondary winding being adapted for connection between the inner conductor and the outer conductor of said connector assembly; and



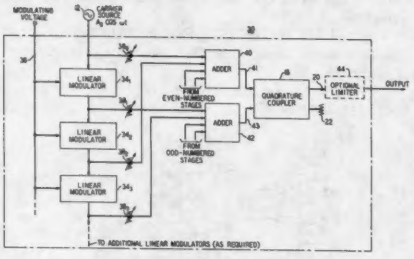
means providing a capacitance electrically connected between said primary and said secondary windings, said capacitance means comprising a washer-like capacitor fitted over the outer conductor of said connector assembly.

4,229,715

PRECISION PHASE MODULATORS UTILIZING CASCADED AMPLITUDE MODULATORS

Paul S. Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1978, Ser. No. 969,775
Int. Cl.³ H03C *3/38*
U.S. Cl. 332—18 **2 Claims**



1. A phase modulator comprising

a first and a second linear suppressed-carrier amplitude modulator, each modulator comprising a first and a second input terminal and an output terminal

characterized in that

the first and second modulators are connected in cascade with the output terminal of the first modulator connected to the first input terminal of the second modulator, and the first input terminal of the first modulator and the second input terminals of the first and second modulators are capable of receiving a carrier signal and a modulating signal, respectively;

the phase modulator further comprising

an adding means comprising a first and second input terminal coupled to the first input terminal of the first modulator and the output terminal of the second modulator, said adding means being capable of generating an output signal corresponding to the sum of the input signals;

a quadrature coupler capable of combining in quadrature the output signals from the adding means and the first modulator to provide a phase modulated output signal; and

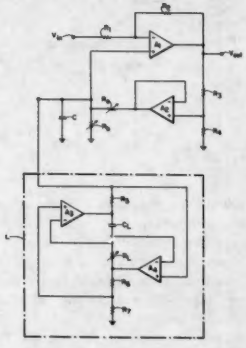
a first, second and third weighting means capable of introducing a separate predetermined weighting factor to the signal being applied to the first and second input terminal of the adding means and the output signal from the first modulator being applied to the quadrature coupler, respectively.

4,229,716

AMPLITUDE EQUALIZER CIRCUIT

Israel Levi, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 16, 1979, Ser. No. 39,257
Int. Cl.³ H04B *3/04*
U.S. Cl. 333—28 R **4 Claims**



1. A variable amplitude equalizer circuit comprising:

first and second operational amplifiers each having an inverting input, a non-inverting input and an output;

a signal input and signal output coupled respectively to the inverting input and output of the first operational amplifier;

a resistive divider network coupling the output of the first operational amplifier to the non-inverting input of the second operational amplifier;

a first resistor connected in series between the output of the second amplifier and the non-inverting input of the first amplifier for controlling the amplitude of the equalizer circuit;

a second resistor connected in shunt across the non-inverting input of the first amplifier to control the bandwidth of the equalizer circuit;

a parallel resonant network connected in shunt across the non-inverting input of the first amplifier to control the center frequency of the equalizer circuit;

whereby varying the parallel resonant network, the shunt connected resistor and the serially connected resistor in that order enables unidirectional functional tuning of the equalizer circuit.

4,229,717

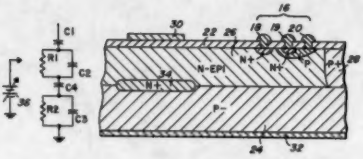
VOLTAGE CONTROLLED SLOW WAVE TRANSMISSION LINE

Kenneth T. Krone, Coral Springs, and Quirino Balzano, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 20, 1978, Ser. No. 944,117

Int. Cl.[3] H01P *1/18, 3/08;* **H01L** *29/92;* **H01P** *1/16*

U.S. Cl. 333—156 **3 Claims**



1. A slow wave transmission line in an integrated circuit comprising in combination:

a first layer of semiconductor material of a first type;

a second layer of semiconductor material of a second type, grown on a first surface of said first semiconductor layer;

an insulating layer formed on the surface of said second semiconductor layer;

a metallized strip formed on the surface on said insulating layer;

a heavily doped buried layer of the second type diffused in an area extending laterally under the area of the metallized strip and between the first and second layers of semiconductor material;

a metallized layer formed on a second surface of said first semiconductor layer;

means for providing a biasing control voltage coupled between the second layer of semiconductor material and the metallized layer on the second surface of the first semiconductor material; and

conductive means coupled to said metallized strip and said metallized layer for making connections thereto.

4,229,718

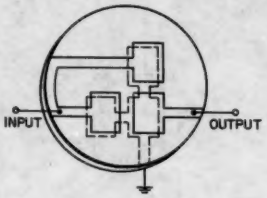
WIDE-BANDWIDTH MONOLITHIC CRYSTAL FILTER

Aristotelis S. Arvanitis, Addison; Thomas W. Re, Wheaton, and Stanley Malinowski, Park Ridge, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 19, 1979, Ser. No. 31,644

Int. Cl.[2] H03H *9/04, 9/26, 9/32*

U.S. Cl. 333—192 **8 Claims**



1. A wide-bandwidth two-pole monolithic crystal filter having a predetermined center frequency, comprising:

a piezoelectric substrate having first and second flat, parallel surfaces, the substrate having a predetermined fundamental frequency that is greater than the filter center frequency;

output electrode means disposed on the first surface of the substrate, the output electrode means tuned to the filter center frequency;

a plurality of input electrode means, each input electrode means predeterminedly disposed on the first surface along the crystallographic axes of the substrate in orthogonal relationship with respect to the output electrode means, each input electrode means being tuned to the filter center frequency; and

common electrode means disposed on the second surface of the substrate in opposing relationship with said input and output electrode means.

4,229,719

CONTACTOR

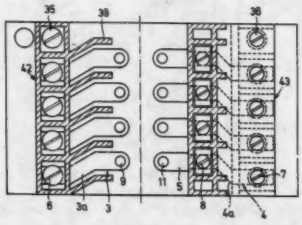
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Starkstrom Schaltgeraetefabriken Sprindler Deissler GmbH & Co. KG, Marienheide-Roth, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,339

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732963

Int. Cl.[2] H01H *67/02*

U.S. Cl. 335—132 **7 Claims**



1. A contactor, comprising, in combination, a housing having a mounting side for mounting the housing on a switchboard

or the like, the housing being provided with a housing cover section at the side thereof remote from the mounting side, a contact system and a magnet system accommodated within the housing, the magnet system activating the contact system, the contact system comprising contact bars with contact terminal screws and stationary contact pieces and jointly activatable bridging members having movable contact pieces cooperating with the stationary contact pieces to form relay switches, the contact terminal screws comprising at least a first row of contact terminal screws located in a first plane parallel to and spaced a first distance from the mounting side of the housing and a second row of contact terminal screws located in a second plane parallel to and spaced a different second distance from the mounting side of the housing, the contact terminal screws of the first row, when viewed in the direction normal to the first and second planes, being offset relative to the contact terminal screws of the second row in the direction in which the first and second rows extend.

4,229,720

DEFLECTION UNIT FOR A COLOR TELEVISION DISPLAY TUBE

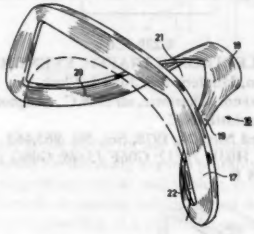
Werner A. L. Heijnemans; Joris A. M. Nieuwendijk, and Nicolaas G. Vink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1979, Ser. No. 3,431

Claims priority, application Netherlands, Jan. 18, 1978, 7800585

Int. Cl.³ H01F *5/00*

U.S. Cl. 335—213 **4 Claims**



1. A deflection unit for a color television display tube having a neck portion a display screen and a partly flared outer surface portion therebetween, said deflection unit comprising a field deflection coil, a line deflection coil, each of said deflection coils being formed by a pair of diametrically oppositely positioned coil portions, and an annular core of a magnetically permeable material surrounding at least the line deflection coil, each line deflection coil portion being in the form of a saddle coil and having conductors wound to produce first and second side members, a front end and a rear end which together define a window, said front end being in the form of a flange, the front ends of the coil portions of said line deflection coil, when said deflection unit is mounted on a display tube, being closer to the display screen than are the rear ends, with said front ends substantially surrounding a part of the flared portion of the display tube and the plane of the flange-like front ends being at an angle to the longitudinal axis of said display tube, and said first and second side members extending mainly parallel to the tube axis characterized in that the front ends of the line deflection coil portions together define a path whose length is greater than the length of a path around the flared portion of the display tube at which said front ends are intended to surround.

4,229,721

WELDING TRANSFORMER WITH DROOPING VOLTAGE-CURRENT CHARACTERISTICS

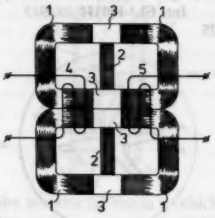
Wiktor Koloczek; Edward Dobaj, and Tadeusz Zaremba, all of Gliwice, Poland, assignors to Instytut Spawalnictwa, Gliwice, Poland

Filed Nov. 15, 1978, Ser. No. 961,034

Claims priority, application Poland, Nov. 30, 1977, 202582

Int. Cl.² H01F *21/06*

U.S. Cl. 336—133 **8 Claims**



1. A welding transformer with drooping voltage-current characteristic adapted for supplying welding arc, comprising a magnetic core wound from transformer plate, said core having spaced legs defining a window, primary and secondary windings wound on said legs of said core in spaced relation, and a magnetic flux shunt movably inserted into said window between the primary and secondary coils, and spacing blocks in said legs at the junction of said shunt with said legs to reduce eddy currents within the magnetic core.

4,229,722

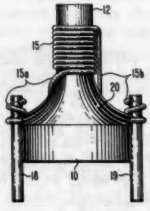
WIRE COIL ASSEMBLY FOR AN ELECTRICAL CIRCUIT

Perry C. Olsen, Noblesville, Ind., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 909,038, May 24, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 54,094

Int. Cl.³ H01F *15/10*

U.S. Cl. 336—192 **2 Claims**



1. A wire coil assembly comprising:

a body form about which a wire having end portions is wound;

mounting means secured to an end of said body form for providing a mounting base for said body form;

fillet means disposed at the juncture of said body form and said mounting means, and overlying a surface of said mounting means which contacts said body form, said fillet means having a plurality of exposed grooves extending in different directions from respective points at the juncture of said mounting means and said body form toward the periphery of said mounting means;

a plurality of terminals secured to said mounting means; and wherein

said end portions of said wire are routed from respective points in the vicinity of the juncture of said fillet means

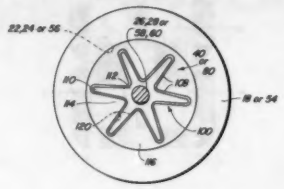
and said body form, through respective ones of said grooves, to respective ones of said terminals.

4,229,723

DIAPHRAGM HAVING A PATTERN OF REDUCED THICKNESS IN A HIGH VOLTAGE, CIRCUIT-INTERRUPTING DEVICE

Thomas J. Tobin, Northbrook, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Apr. 4, 1979, Ser. No. 26,842
Int. Cl.³ H01H *33/915*
U.S. Cl. 337—275 **24 Claims**



24. An improved circuit-interrupting device of the type wherein an arcing rod is moved away from a stationary contact following an overcurrent through the device and pressurized dielectric fluid is directed from a port of a container at an elongating arc formed between the moving arcing rod and the contact; the device having a diaphragm normally contacted by the arcing rod for normally closing the port and for restraining arcing rod movement; wherein the improvement comprises:

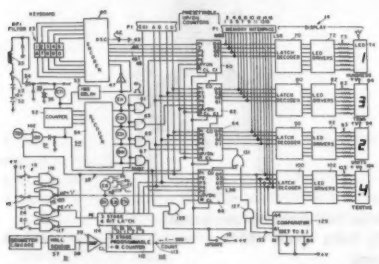
the diaphragm having a variable cross section so dimensioned that the current density is the same in all portions thereof.

4,229,724

VEHICLE POSITION INDICATOR WITH SELECTABLE POSITION ALARM MEANS

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Aug. 4, 1977, Ser. No. 821,779
Int. Cl.² G08G *21/00*; G06F *15/20*
U.S. Cl. 340—23 **24 Claims**



22. A vehicle mile marker display and alarm system comprising:

circuit means for providing data corresponding to the current mile marker position of a vehicle as it travels along a roadway;

memory circuit means and vehicle operator actuated digital keyboard coupled to said memory circuit means permitting the vehicle operator to enter data corresponding to at least one upcoming mile marker location toward which the vehicle is travelling;

comparator circuit means coupled to said circuit means and to said memory circuit means for providing an output signal when the data corresponding to the current mile marker location has a predetermined relationship to the data in said memory circuit means; and

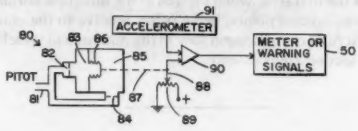
alarm means coupled to said comparator circuit means for alerting the vehicle operator in response to the receipt of said output signal.

4,229,725

WIND SHEAR WARNING SYSTEM FOR AIRCRAFT

Richard J. Reilly, 1759 Venus, St. Paul, Minn. 55112

Continuation of Ser. No. 662,557, Mar. 1, 1976, abandoned. This application May 12, 1978, Ser. No. 905,377
Int. Cl.² G08B *21/00*; G01C *23/00*
U.S. Cl. 340—27 SS **4 Claims**



1. A system to detect a wind shear condition encountered by an aircraft having a pitot pressure sensing tube for measuring air speed comprising in combination:

pitot pressure sensing means;

pressure change measuring means connected to said pressure sensing means operable to produce a signal proportional to the rate of change of pressure in said pitot tube;

a reference means calibrated to represent the maximum acceleration capability of said aircraft; and

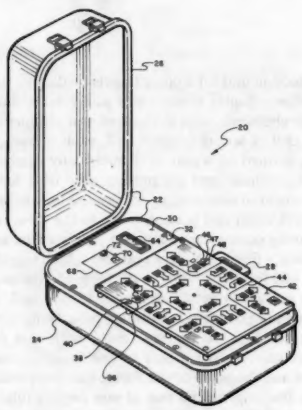
indicating means connected to said pressure change measuring means and said reference means so as to display the signal therefrom relative to the reference means.

4,229,726

PORTABLE ELECTRONIC TRAFFIC EVENT RECORDER

Willis R. Deaton, Huntersville; John I. Clark, Jr., Newell, and Harold M. Raynor, Charlotte, all of N.C., assignors to City of Charlotte, Charlotte, N.C.

Filed Nov. 24, 1978, Ser. No. 963,462
Int. Cl.³ H03K *21/32*; G06F *15/48*; G08G *1/00*
U.S. Cl. 340—38 R **5 Claims**



1. Apparatus for recording traffic events occurring at a variety of vehicular traffic passageways comprising:

(a) a portable housing unit;

(b) electronic data processing means contained in said housing unit;

(c) a plurality of display boards, each such display board displaying different vehicular traffic patterns and symbolic traffic events thereon, and each such display board being selectively and alternately mountable on said portable housing unit;

(d) a plurality of manually operated signaling means disposed at predetermined locations, said locations being selected to cause at least some of said plurality of signaling means to coincide with particular ones of said symbolic traffic events displayed on each said display board when it is mounted on said housing unit, and each said signaling means generating an electrical signal each time it is operated;

(e) electrical means interconnecting said plurality of signaling means and said electronic data processing means; and

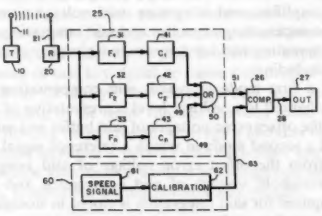
(f) said electronic data processing means including an electronic memory means for receiving and storing said electrical signals generated by said signaling means.

4,229,727

VEHICLE SPEED ALARM

Robert Gilhooley, 1311 Lincoln Ave. South, Highland Park, Ill. 60035

Filed Apr. 23, 1979, Ser. No. 32,532
Int. Cl.[3] B60Q *1/54*
U.S. Cl. 340—53 **2 Claims**



1. A vehicle speed alarm for use in a vehicle comprising:

receiver means for receiving any of a plurality of transmitted signals originating outside said vehicle, each of said transmitted signals containing individualized frequency information corresponding to a different pre-established maximum vehicular speed;

a plurality of filter means, each being tuned to a different frequency, for producing a filtered signal upon receipt of a transmitted signal having frequency information corresponding to the frequency to which said filter means are tuned;

convertor means, coupled to said plurality of filter means for producing a predetermined strength signal upon receipt of said filtered signal;

OR gate means coupled to said convertor means, for producing a reference signal upon receipt of any predetermined strength signal from said convertor means;

generator means for producing a signal corresponding to the instantaneous speed of said vehicle;

calibration means, coupled to said generator means, for producing a speed signal compatible, for comparison purposes, with said reference signal; and

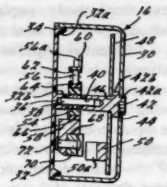
comparator means having a first input coupled to said OR gate means for receiving said reference signal, and a second input coupled to said calibration means for receiving said speed signal; said comparator producing a control signal only when said speed signal exceeds said reference signal, whereby the presence of said control signal indicates that the instantaneous speed of said vehicle exceeds said pre-established maximum vehicular speed.

4,229,728

TIRE PRESSURE MONITOR

Joseph A. Tremba, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 20, 1978, Ser. No. 970,953
Int. Cl.[3] B60C *23/04*; H02K *21/08*
U.S. Cl. 340—58 **8 Claims**



1. A tire pressure monitor for use in a vehicle having at least one pneumatic tire, said tire pressure monitor comprising:

a cylindrical generator housing adapted for coaxial mounting upon an automobile wheel and defining a pivot internally axially aligned therewith;

an inductor mounted within said housing for rotation therewith at a point radially spaced from said pivot, said inductor having a magnetic axis normal to said pivot;

a yoke mounted for rotation about said pivot;

a pendulum weight mounted to said yoke for rotation therewith, said weight being radially displaceable between a first position adjacent said yoke and a second position adjacent the circumferential wall of said housing;

spring means operative to bias said weight into said first position;

a permanent magnet mounted for displacement with said weight and disposed in rotational alignment with said inductor, said inductor and magnet coacting during relative rotation therebetween to generate an electrical potential;

transmitter means disposed within said housing, and operative to receive said electrical potential and to generate a low tire condition signal when the fluid pressure within said tire falls below a predetermined value; and

receiver means disposed remotely from said transmitter means and operative to receive said low tire condition signal and to generate an alarm signal as a function thereof.

4,229,729

ANALOG TO DIGITAL CONVERTER UTILIZING A QUANTIZER NETWORK

Don C. Devendorf, and Eugene Baskevitch, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 650,820, Jan. 20, 1976, abandoned. This application May 19, 1978, Ser. No. 907,478
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD **11 Claims**

1. An analog to digital converter for quantizing an analog input signal into 2^N quantization levels of increasing significance, adjacent levels being separated by a quantization differential, said converter converting each level into an output code comprising:

a first resistive network for providing said 2^N quantization levels;

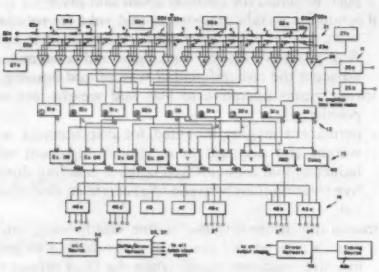
a second resistive network coupled to receive said analog input signal;

2^N differential amplifiers, each coupled to said first and second resistive networks, each responsive to said analog input signal for comparing said input signal with one of said 2^N levels to provide a binary output signal for the levels that are exceeded, said differential amplifiers form-

ing first and second sections each including half of the 2^N differential amplifiers, said first section having a greater order of significance than said second section, the differential amplifiers of each section having a sequential order of significance varying from a most to a least significant level for the section;

$2^{N-1}-1$ latches, each latch having first and second inputs for respectively setting said latches in first and second states, with said $2^{N-1}-1$ latches each having said first and second inputs respectively coupled to a different pair of differential amplifiers of the same order of significance, said pair being a differential amplifier in each of said first and second sections,

a position latch and a most significant bit latch each having an input for being set to a first binary state and having their respective inputs coupled to the differential amplifier of the most significance in the respective first and second sections, said $2^{N-1}-1$ latches and said most significant bit latch each representing one of the cyclic bit positions of a cyclic code having 2^N code numbers, said position latch representing the cyclic state of an overflow code number, and said most significant bit latch representing the most significant bit position of said cyclic code, said cyclic code



changing the state of only one cyclic bit position between sequential cyclic code numbers, the bit positions of each of said $2^{N-1}-1$ latches and said most significant bit latch having a first binary state for half of the 2^N code numbers and a second binary state for the other half of the 2^N code numbers, each of said $2^{N-1}-1$ latches changing binary states in response to the corresponding differential amplifier of the same significance in the first or the second sections, said position latch and said most significant bit latch each changing binary state in response to the corresponding differential amplifier of said respective first and second sections, and

binary encoding means coupled to said latches to provide an N bit binary code and a position bit, said position bit being at said second binary state for said 2^N code numbers and changing to said first binary state for said overflow code number;

reset means coupled to said $2^{N-1}-1$ latches to said position latch and to said most significant bit latch and for periodically resetting said latches;

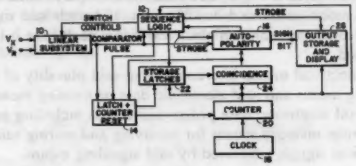
whereby said $2^{N-1}-1$ latches which are triggerable to opposite states in response to different quantization levels are triggered in response to input signal levels separated by half of the 2^N quantization levels.

4,229,730

MODIFIED DUAL-SLOPE ANALOG TO DIGITAL CONVERTER

Robert C. Huntington, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 666,528, Mar. 12, 1976, abandoned.
This application Jan. 29, 1979, Ser. No. 7,064
Int. Cl.³ H03K *13/20*
U.S. Cl. 340—347 NT **1 Claim**



1. In an apparatus for converting an analog input signal into digital output signals an input means comprising:

(a) a buffer amplifier;

(b) an integrator including an integrating capacitor wherein the output of said buffer amplifier is selectively coupled to one terminal of said integrator;

(c) a compensating capacitor;

(d) a voltage comparator coupled to the output of said integrator; and

(e) switch means selectively interposed between said buffer amplifier, said integrator, said voltage comparator, said compensating capacitor and said integrating capacitor for operating said input means in a plurality of analog modes, including:

(f) a first mode in which said compensating capacitor is charged to a voltage level representative of a function of the offset error voltages of said buffer and said integrator;

(g) a second mode in which a reference signal is integrated from the offset error voltage of said integrator to the threshold voltage of said comparator and the time required for said integration is stored in storage means connected to said input means;

(h) a third mode in which said compensating capacitor is recharged to a voltage level representative of a function of the offset error voltage of said buffer and said integrator;

(i) a fourth mode in which the analog input signal is integrated for a predetermined period of time;

(j) a fifth mode in which the reference signal is integrated for a time corresponding to the time required for the integration of the reference signal from the offset error voltage of said integrator to the threshold voltage of said comparator;

(k) a sixth mode in which the reference signal is further integrated until the comparator threshold voltage is reached; and

(l) whereby the measured time is converted into digital output signals representative of the magnitude of the analog input signal.

4,229,731

MONOLITHIC INTEGRATED ORGAN GATE CIRCUIT

Dieter Holzmann, Freiburg-Munzingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

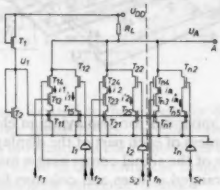
Filed Mar. 12, 1979, Ser. No. 19,396
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814175
Int. Cl.³ G10H *11/34*
U.S. Cl. 340—365 E **7 Claims**

1. A parallel gate circuit apparatus for providing an audio tone across a common load resistor, said load resistor arranged to receive additional audio tones from additional parallel gate circuits upon receipt by said gate circuits of separate key signals for each tone, wherein said key signals can be simulta-

neously provided to undesirably cause an increased DC component to appear across said load resistor due to the total increase of current through said resistor upon activation of more than one key, and therefore upon activation of more than one parallel gate circuit, said gate circuit apparatus for eliminating said undesired DC component, comprising:

a selectively activated audio tone circuit path in series with said load resistor and operative when activated to provide a tone current superimposed upon a predetermined DC current to cause said superimposed current to flow through said load resistor providing an output indicative of said audio tone,

a selectively operated rest current circuit path in parallel



with said tone circuit path and operative when activated to cause a rest DC current to flow through said load resistor,

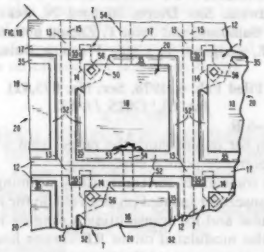
means for applying said key signal to both said tone circuit path and said rest current path to cause said tone circuit path to activate only during the presence of said key signal and to cause said rest current path to activate only during the absence of said key signal, to cause a controlled value DC current to always flow through said load resistor corresponding to the mean value of the total audio signal current flowing therethrough, whereby a plurality of such gate circuits arranged in parallel with each other can share said common load resistor without providing said undesirable DC component during multiple key signals.

4,229,732

MICROMECHANICAL DISPLAY LOGIC AND ARRAY

Allan M. Hartstein, Chappaqua, N.Y., and Kurt E. Petersen, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,054
Int. Cl.³ G08B 5/24
U.S. Cl. 340—378.2 **8 Claims**



1. A display device suitable for X-Y matrix addressing comprising:

a (100) oriented p-Si wafer;

a first layer of silicon containing regions of heavily boron doped (p^{30}) type silicon on the order of 5×10^{19} cm^{-3} as an etchant barrier;

a second layer of silicon having a thickness of 5–10 μm taken from the group consisting of p-type and n-type positioned on top of said first layer;

a layer of SiO_2 3000–5000 Å thick above said second layer of silicon;

an MOS device formed in said second layer;

a plurality of hinged, electrostatically deflectable, metal coated oxide display members in spaced relation with said boron doped regions in said first layer and connected with a portion of said second layer, whereby said heavily boron doped region serves as a conductive region below each of said display members for provision of electrostatic control signals to said display member;

metallization forming the metal surface on said display members and forming an electrical x-y control matrix array deposited upon said layer of SiO_2 comprising Al/Au/Cr about 500 Å thick; and

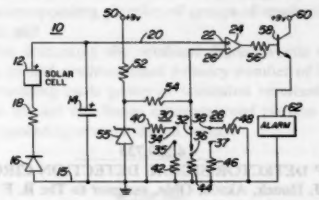
each of said display members comprising a leaf element hinged to said second layer at one small portion of the edge thereof, said leaf element being located above a hollow space in said display device.

4,229,733

EXPOSURE DETECTING DEVICE

Thomas N. Tulenko, 2132 Spruce St., Philadelphia, Pa. 19103, and Carmen A. Di Camillo, Philadelphia, Pa., assignors to Thomas N. Tulenko, Philadelphia, Pa.

Filed Aug. 10, 1978, Ser. No. 932,553
Int. Cl.² G08B 23/00, 17/12; G01J 1/42
U.S. Cl. 340—500 **14 Claims**



1. An exposure detecting device for determining the safe limit for exposure of a subject to ultraviolet radiation comprising a radiation detector means for sensing radiation received by a subject and providing an output signal responsive to the intensity of received ultraviolet radiation, a storage means receiving the output signal of said detector means and providing an output signal which increases as a function of the received output signal and its duration, and decreases in the absence of a received signal as a predetermined function of time corresponding to the recovery rate of the subject to the radiation, a sensitivity control means providing a reference signal related to the sensitivity of the subject to the radiation, comparing means receiving the output signal of said storage means a reference signal from said sensitivity control means and delivering an output signal when the storage means output signal exceeds a predetermined value with respect to the reference signal, and alarm means activated upon receiving an output signal from said comparing means.

4,229,734

LINE SUPERVISION

Richard M. Schultz, McHenry, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 26, 1978, Ser. No. 955,085
Int. Cl.² G08B 26/00, 29/00
U.S. Cl. 340—512 **34 Claims**

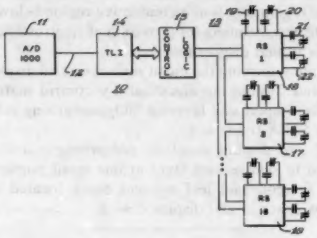
1. A security system for supervising the integrity of a communication line comprising:

supervision means connected to said communication line having

first means for supplying first and second randomly generated signals to said communication line,

second means for providing a third signal based upon said first and second randomly generated signals, and

third means for comparing said third signal to a fourth signal and for providing an output signal when said third and fourth signals are not in agreement; and,



transponder means connected to said communication line having

fourth means for comparing said first and second randomly generated signal to produce said fourth signal,

fifth means connected to said fourth means for supplying said fourth signal to said communication line.

4,229,735

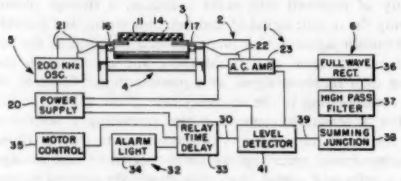
RIP DETECTOR SIGNAL DETECTION CIRCUIT

Robert J. Houck, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 23, 1978, Ser. No. 871,664

Int. Cl.[2] B65G *43/02*; G08B *21/00*; H04B *1/10*

U.S. Cl. 340—676 **28 Claims**



1. A detection circuit for a conveyor belt rip detector system or the like in which an AC signal is pulse modulated to carry characteristic information indicative of the integrity condition of such conveyor belt or the like, comprising means for producing from such AC signal a substantially DC signal normally at a substantially constant magnitude and carrying such characteristic information as substantially DC pulses, reference means for developing a reference DC signal, comparator means for comparing such substantially DC pulses and such DC reference signal to produce an output indicative of the relative magnitudes thereof as an indication of the integrity of such conveyor belt, and bias means for altering such reference signal to an altered reference signal in proportion to a parameter of such AC signal.

4,229,736

SEMICONDUCTOR DISPLAY APPARATUS

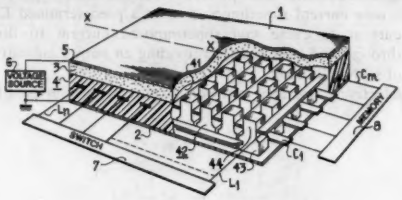
Henri Rougeot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 8, 1977, Ser. No. 822,637

Claims priority, application France, Aug. 10, 1976, 76 24389

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—782 **7 Claims**



1. An analog apparatus for displaying an electrical signal in which the brightness of each part of the display is proportional to the amplitude of the signal comprising a matrix of semiconductor parts, arranged in lines and columns for memorization and amplification of said analog electrical signal; two command grids joined to said matrix, having electrodes parallel respectively to said lines and to said columns, and in contact with the said semiconductor parts; actuation means connected to the first of said grid, which has its electrodes parallel to the said matrix; memory means for receiving said electrical signal, connected in parallel to the electrodes of the second of said grids and for transferring its contents to an activated line of said matrix, the semiconductor parts of the said activated line would then each store a second analog electrical signal proportional to the amplitude of said analog electrical signal and for controlling a flow of current therethrough in accordance with said store signal; display layer means adjacent one extremity of said semiconductor parts for displaying the electrical signals stored by the said semiconductor parts when a current flows through said parts and; means for applying a potential across the display layer and the extremities of each of the semiconductor parts, whereby causing a current flowing through each semiconductor part and the adjacent display layer to be proportional to the second electrical signal stored in the part, and the intensity of the display is proportional to that current.

4,229,737

RANGING SYSTEM AND METHOD FOR DETERMINING THE RANGE OF A VEHICLE FROM A PLURALITY OF REFERENCE POINTS

Carl A. Heldwein, San Diego; Richard N. Jekel, La Mesa; Stephen R. Sampson, and John T. Zupan, both of San Diego, all of Calif., assignors to Cubic Western Data, San Diego, Calif.

Filed Feb. 6, 1978, Ser. No. 875,421

Int. Cl.[3] G01S *13/87*

U.S. Cl. 343—6 R **23 Claims**

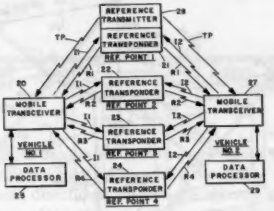
1. A system for determining the range from a vehicle to a plurality of reference points, comprising

a reference transmitter for transmitting a timing pulse;

a mobile transceiver located on the vehicle for receiving the timing pulse and for transmitting a ranging interrogation signal pulse modulated on an RF carrier having a given frequency in response to the timing pulse, and for receiving ranging response signal pulses modulated on RF carriers having the given frequency;

a plurality of reference transponders, one of which is located at each of the plurality of reference points for receiving the timing pulse and the ranging interrogation signal pulse on a carrier having the given frequency and for responding thereto by transmitting a ranging response signal pulse on a carrier having the given frequency during an interval

that is discrete from the intervals during which ranging response signal pulses are transmitted from the other reference transponders, wherein within a given time slot in relation to the timing pulse, a single ranging interrogation signal pulse is followed by a sequence of the discrete ranging response signal pulses; and



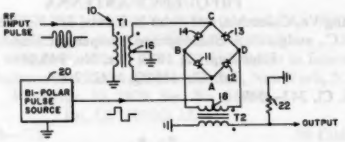
processing means located on the vehicle for determining and processing the phase of the received ranging response signal pulses in relation to the transmitted ranging interrogation signal pulse to determine the range from the vehicle to the individual reference points.

4,229,738

EARLY-LATE GATE

Robert T. Campbell, Acton, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1979, Ser. No. 4,636
Int. Cl.³ G01S *13/70*
U.S. Cl. 343—7.3 **4 Claims**



1. In a range tracking system of a radar a method for providing early-late gating of radio frequency input pulses with a double-balanced mixer and comprising the steps of:

applying bi-polar pulses to the center tap of a first transformer of said double-balanced mixer,

selectively gating a diode bridge of said double-balanced mixer on and off in response to said bi-polar pulses, and

directing radio frequency input pulses to a second transformer of said mixer for coupling through said bridge and first transformer to provide an output signal in accordance with the on-off state of said diode bridge.

4,229,739

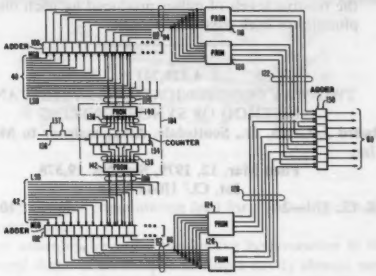
SPREAD BEAM COMPUTATIONAL HARDWARE FOR DIGITAL BEAM CONTROLLERS

Winthrop W. Smith, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 29, 1978, Ser. No. 964,565
Int. Cl.² H04B *7/00*
U.S. Cl. 343—100 SA **10 Claims**

1. In a spread beam computational section of a digital beam controller for an electronically controlled phased array radar system including a linear computational portion for computing a plurality of groups of a predetermined number of intermediate phase command digital words corresponding to a desired spread beam radar pattern, each intermediate phase command digital word having a predetermined primary number of bits and a predetermined residue number of bits; and a non-linear computational portion for computing a spread beam phase command digital word from each computed group of said intermediate phase command digital words which have been digitally rounded off, the improvement of an apparatus for digitally rounding off each computed group of intermediate phase command digital words comprising:

a random number generator for randomly generating digital words sized in relation to the predetermined residue number of bits of said computed intermediate phase command digital words;



means for digitally adding a digital word randomly generated from said random number generator to the predetermined residue bits of said computed intermediate phase command digital words in each computed group to generate a corresponding plurality of groups of resultant digital words; and

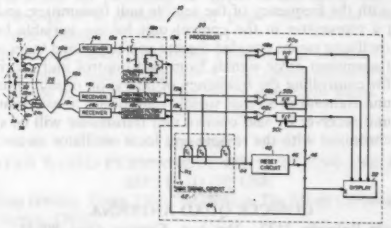
means for truncating the resultant digital words of each group to said predetermined primary number of bits and for providing each group of truncated resultant digital words to said non-linear computational portion of said beam spreading computational section.

4,229,740

RADIO FREQUENCY SIGNAL DIRECTION FINDING SYSTEMS

Nicholas J. Krilanovich, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 4, 1978, Ser. No. 966,172
Int. Cl.³ G01S *5/02*
U.S. Cl. 343—113 R **6 Claims**



1. A radio frequency signal direction finding system comprising:

(a) a multi-beam antenna having a plurality of feed ports, each one in such feed ports receiving radio frequency energy from a received radio frequency signal, the levels of such energy received at the feed ports being associated with the angle of arrival of the received signal;

(b) receiver means, coupled to the plurality of feed ports, for producing a plurality of output signals, each one of the plurality of output signals having a level related to the

level of radio frequency energy received at a corresponding one of the plurality of feed ports;

(c) a plurality of high pass filter means, each one fed by a corresponding one of the output signals produced by the receiver means, for differentiating the output signal fed thereto producing a pulse in response to, and having a level related to, a change in level of the output signal fed thereto; and,

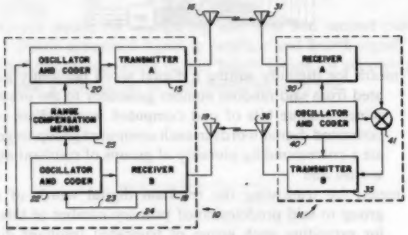
(d) means, responsive to the pulse produced by each one of the plurality of high pass filter means, for determining the angle of arrival of the received signal in accordance with the relative levels of pulses produced by each one of the plurality of high pass filter means.

4,229,741

TWO-WAY COMMUNICATIONS SYSTEM AND METHOD OF SYNCHRONIZING

Edward J. Groth, Jr., Scottsdale, Ariz., assignor to Motorola, Inc.

Filed Mar. 12, 1979, Ser. No. 19,378
Int. Cl.[2] H04J *5/14*
U.S. Cl. 370—24 **10 Claims**



1. A two-way communications system including a control unit and a remote unit, said system comprising:

(a) a transmitter and a receiver in the remote unit with means for sensing errors in frequency between signals received by said remote unit receiver and the operating frequency of said remote unit receiver, and coupling the sensed errors to the remote unit transmitter for transmission thereby;

(b) a receiver in the control unit approximately tuned to receive transmissions from said remote unit transmitter and including variable local oscillator means connected to said control unit receiver in a closed loop for synchronizing the operating frequency of the control unit receiver with the frequency of the remote unit transmitter; and

(c) a transmitter in the control unit having variable local oscillator means coupled thereto and connected to receive transmitted error signals from said control unit receiver for controlling the frequency of operation of said control unit transmitter so that signals transmitted to said remote unit receiver by said control unit transmitter will be synchronized with the remote unit local oscillator means.

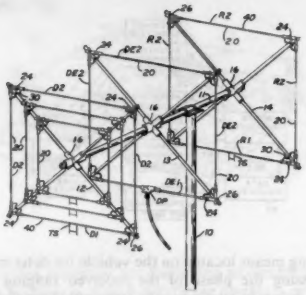
4,229,742

CUBICLE QUAD ANTENNA

Orlando Rotunda, 2132 - 21st Ave., Greeley, Colo. 80631

Filed Jun. 18, 1979, Ser. No. 49,130
Int. Cl.[3] H01Q *1/16, 7/00*
U.S. Cl. 343—742 **3 Claims**

1. In combination with a Cubicle Quad antenna having a vertical mast, a horizontal boom secured to the mast, a four spoke radial spider arm secured to the boom, and a cubicle wavelength antenna wire element extending from spider arm to spider arm in a box-like configuration, with each one-fourth portion of said wire element between spider arms being enclosed within a semirigid non-conductive material rod and with each end of said wire extending outwardly of its rod adjacent its rod end, the combination therewith of a ball-and-socket joint connection means in longitudinal rod extension at each end of each rod, with one of either the ball or the socket of said means being secured to a spider arm and the other thereof being secured to the adjacent end of the rod, and a



loosely spanned braided circuit wire connection extending between each adjacent wire end at each corner of the cubicle element, with said ball-and-socket connecting means comprising pivot means for permitting free pivotal movement of the antenna element when caused by wind.

4,229,743

MULTIPLE BAND, MULTIPLE RESONANT FREQUENCY ANTENNA

Thang Vo, Columbia, and John R. Lewis, Jr., Newberry, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed Sep. 22, 1978, Ser. No. 945,055
Int. Cl.[3] H01Q *1/32, 9/27*
U.S. Cl. 343—749 **6 Claims**

1. A self-tuned antenna for use with at least one radio comprising:

a linear radiator connected to the radio;

a spiral radiator; and,

a network connected between said linear radiator and said spiral radiator for optimizing antenna impedance variations with frequency, said network including a first coil and at least one other conductor electrically connected to said first coil at only one end of said first coil, said conductor entwined and in operative association with said first coil throughout the entire range of frequencies of interest, resulting in the antenna having a plurality of natural resonant frequencies, each of said natural resonant frequencies occurring in separate operating bands throughout said range of frequencies of interest.

4,229,744

DIRECTIONAL ANNULAR SLOT ANTENNA

Arthur Luedtke, Marietta, and William F. Bentley, Smyrna, both of Ga., assignors to The United States of America as represented by the Field Operations Bureau of the Federal Communications Commission, Washington, D.C.

Filed Mar. 14, 1979, Ser. No. 20,296
Int. Cl.³ H01Q *13/12*
U.S. Cl. 343—769 **5 Claims**

1. A concentric broadband antenna array with regular polyangular directional patterns, in which the sum of all patterns produce an omni directional pattern, this antenna comprising:

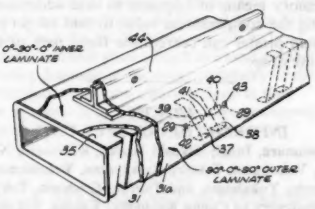
a support means for a plane conductive sheet with a plurality of concentric narrow annular slots forming an inner conductive sheet and an outer conductive sheet around each slot, having a continuous metallic wall attached to said outer conducting sheet adjacent to each said slot, forming an array of cylinders and being closed at the bottom end of each with a metallic sheet, forming an independent cavity beneath each said annular slot; a feed means, which are symmetrically attached across each said annular slot to carry an RF signal from each respective directional antenna pick up pattern to a coaxial cable for carrying an RF signal to an output means in outer most said wall, said coaxial cable shield is grounded at each said slot wall, and has an isolation means along said coaxial cable between each succeeding said cavity wall.

4,229,745

EDGE SLOTTED WAVEGUIDE ANTENNA ARRAY WITH SELECTABLE RADIATION DIRECTION

Bradford E. Kruger, Woodland Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,399
Int. Cl.³ H01Q *13/10*
U.S. Cl. 343—771 **10 Claims**



1. An antenna array comprising at least one slotted-waveguide having a first predetermined slot pattern in a first of its narrow walls and a second predetermined pattern of slots in its second narrow wall comprising:

means comprising first and second sets of radio frequency diodes, said first set comprising at least one diode for each slot in said first slot pattern and said second set comprising at least one diode for each slot in said second slot pattern;

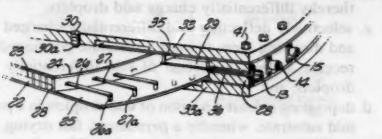
and means for controlling said diodes alternatively into conduction and non-conduction by sets such that said slots in said first pattern are effectively alternatively closed and open while said slots of said other set are contemporaneously alternatively opened and closed, respectively, said diodes each being placed across a corresponding slot so as to provide substantially a radio frequency short-circuit during its conductive condition and substantially no effect on said slot in said non-conductive conditions.

4,229,746

LOOP COUPLER COMMUTATING FEED FOR SCANNING A CIRCULAR ARRAY ANTENNA

Gregory G. Charlton, Reseda, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 21, 1979, Ser. No. 77,850
Int. Cl.³ H01Q *3/24, 3/32*
U.S. Cl. 343—854 **12 Claims**



1. A loop coupler commutating feed for a scanning circular array, comprising:

a stator assembly having a conductive bodymember in the general shape of an annulus having a cavity therein such that the cross-section of said annulus is generally U-shaped opening radially inward, said stator assembly also comprising a plurality of circumferentially distributed stator loops and each radially elongated within said cavity, each of said stator loops having its elongated leg current paths in a radially extending plane normal to the plane of said annulus;

a rotor assembly including a generally circular, conductive disc rotatable about its center, said center being substantially coincident with the geometric center of said annulus, said rotor assembly also including a plurality of rotor loops circumferentially spaced about an arcuate portion of the radially outward surface of said disc, said rotor loops also being radially elongated and each having its elongated leg current paths radial and in radially extending plane normal to the plane of said disc, the plant of said disc being substantially parallel to a plane through said annulus normal to the axis through the center of said annulus, said disc extending radially into said cavity such that said rotor loops couple to an arc of said stator loops in juxtaposition with said rotor loops about said arcuate portion of said disc, said coupling effecting energy transfer between said rotor and stator loops to a changing arcuate portion of said stator loops as said disc is rotated;

first means for providing RF drive to said rotor loops according to a predetermined phase distribution pattern from a stationery first RF port;

and second means comprising a plurality of stationary second ports, each of said second ports being discretely connected to a corresponding one of said stator loops.

4,229,747

WATER BASED PERMANENT JET PRINTING INK AND METHOD OF USE

Ki-Sup Hwang, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 1, 1979, Ser. No. 44,738
Int. Cl.² G01D *15/18*
U.S. Cl. 346—1.1 **10 Claims**

1. A jet drop printing process utilizing a water base permanent jet printing ink comprising:

a. ejecting at high speed from an orifice or orifices an ink composition comprising: a water or solvent soluble dyestuff present in the ink in the range of from about 1 percent to about 10 percent by weight, an alkylene glycol ether as a solvent for said dyestuff and having from 8 to 12 carbon atoms and present in the ink in the range from about 1

percent to about 6 percent by weight, an ethoxylated higher alcohol amine-amide phosphate as a bridging agent for the dyestuff and glycol ether rendering them soluble in water and present in the ink in the range from about 1 percent to about 6 percent by weight, a hydroxylated aliphatic amide as a humectant and present in the ink in the range from about 10 percent to about 40 percent by weight, and the balance water, so that said ink composition issuing from said orifice or orifices breaks into droplets;

b. passing said stream of droplets through a charge ring to thereby differentially charge said droplets;

c. selectively deflecting said differentially charged droplets and directing them toward a substrate positioned so as to receive at least a portion of said differentially charged droplets; and

d. depositing at least a portion of said droplets in a pattern on said substrate, whereby a permanent, fast drying, smudge and light resistant printed pattern is formed on said substrate.

4,229,748

JET DROP PRINTER

Ted F. Williams, Union, and Charles L. Cha, Xenia, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 16, 1979, Ser. No. 12,590
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **15 Claims**

1. An ink jet printer for depositing a plurality of drops of print fluid on a moving print medium, comprising:

fluid reservoir means defining an elongated fluid receiving reservoir for receiving a print fluid,

orifice plate means extending the length of said fluid receiving reservoir and communicating therewith, said orifice plate means defining a plurality of orifices from which filaments of said print fluid emerge, said orifices being positioned along an orifice line on said orifice plate means which is non-parallel with respect to the center line of said orifice plate means, all of said orifices along said orifice line being positioned to one side of said center line for decreased point-to-point variation in stimulation amplitude, said center line extending in the direction of elongation of said fluid receiving reservoir,

stimulator means for inducing bending waves in said orifice plate means which travel along said orifice plate means in a direction parallel to said center line, said waves imparting mechanical stimulation to each of said fluid filaments to cause break up of said filaments into drop streams,

means for selectively charging said drops in said drop streams,

catcher means, positioned adjacent said drop streams, for catching drops in said drop streams, and

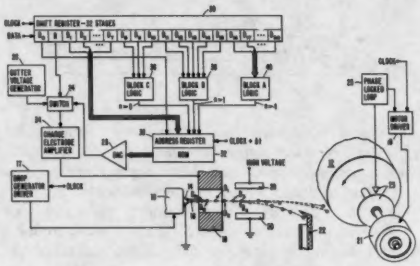
means for deflecting charged drops in said drop streams such that selected ones of said drops are directed to strike said print medium and others of said drops are directed to said catcher means to be caught thereby.

4,229,749

INK DROP COMPENSATION BASED ON PRINT-DATA BLOCKS

Gary L. Fillmore, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,813
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **17 Claims**



1. In an ink jet printer having a charge electrode and a deflection electrode to control the flight of a reference ink drop to a print media in accordance with print data for the drop, apparatus for correcting the flight path of the ink drop to reduce print position error comprising:

print data buffering means for storing the print data pattern of drops in the ink stream with the reference drop;

memory means for storing a compensation value for each of a plurality of print data patterns in the ink stream, said compensation value, when applied to said printer, compensating the flight path of the reference ink drop based upon the data pattern of the ink drops in the ink stream with the reference drops;

logic means responsive to said buffering means for grouping a portion of the print data into a portion of the address for said memory means;

addressing means responsive to said buffering means and to said logic means for addressing said memory means based upon a portion of the print data directly and the remaining portion of the print data indirectly as grouped by said logic means;

said memory means in response to said addressing means reading the compensation value to said ink jet printer so that said printer can correct the flight path of the reference ink drop.

4,229,750

INFORMATION OUTPUT UNIT

Naoto Kawamura, Inagi; Kiyoshi Iizuka, Kawasaki; Nobuyoshi Tanaka, Yokohama; Tetsuro Kuwayama, Yokohama; Kazuya Matsumoto, Yokohama, and Takeshi Goshima, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,923
Claims priority, application Japan, Aug. 4, 1977, 52/93800
Int. Cl.³ G01D *9/42*
U.S. Cl. 346—107 R **20 Claims**

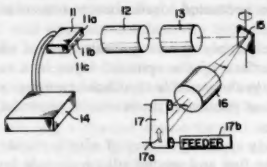
1. An information output unit comprising:

m informatic recording means for recording information on a recording medium, said means being disposed in parallel with each other such that their recording positions are spaced from each other by a distance, between centers, of n elements in a predetermined direction;

shifting means for shifting the relative position between said recording positions of said information recording means and said recording medium at least in the predetermined direction by a distance of l elements during a predetermined time, said l being smaller than the number m of information recording means; and

information output means for rearranging the series se-

quence of input signals applied thereto and for applying said rearranged signals to θ of said information recording means at substantially the same time;



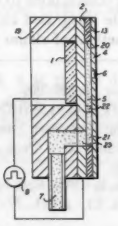
wherein m/θ is a natural number, $i \leqq m/\theta$ where i is a natural number to which m/θ is prime and mn/θ and $ni+1$ are prime to each other.

4,229,751

INK JET HEAD

Masayoshi Tamai, Ebina, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1979, Ser. No. 34,835
Claims priority, application Japan, May 4, 1978, 53-53492
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **3 Claims**



1. In an ink jet head including a front plate formed with a nozzle, a resilient plate disposed in spaced relation with the front plate so as to form an ink chamber therebetween, an electrostrictive element laminated to the side of the resilient plate which faces away from said front plate for deforming the resilient plate into the ink chamber, the ink jet head characterized in that the resilient plate is fixed to a base member, the base member being disposed at the outer periphery of the electrostrictive element and further characterized in that

said ink chamber is formed by a spacer positioned between the front plate and the resilient plate.

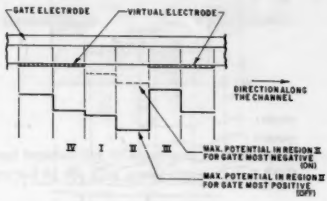
4,229,752

VIRTUAL PHASE CHARGE TRANSFER DEVICE

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 16, 1978, Ser. No. 906,385
Int. Cl.² H01L *29/78;* **G11C** *19/28*
U.S. Cl. 357—24 **5 Claims**

1. A charge-transfer device comprising a semiconductor substrate of one conductivity type including therein a buried channel of opposite conductivity type for charge-transfer, an insulating layer on said substrate over said channel, a conductive layer covering said insulating layer for receiving charge transfer clock pulses, said conductive layer being separated from said channel by said insulating layer, said substrate further including input means for inputting charge packets to one end of said channel and output means for extracting charge packets from the opposite end of said channel, and wherein along the length of said channel first storage and transfer regions constituting a clocked phase are separated by second storage and transfer regions constituting a virtual phase, a transfer region being located between the input means and a corresponding storage region, said virtual phase including a surface layer of said one conductivity type, having a higher impurity concentration than the substrate; a first layer of immobile charge comprised of dopant impurities of opposite



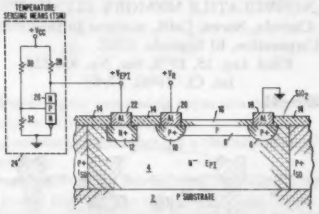
conductivity type from that of said substrate included in said second transfer and storage regions, having a higher concentration in the storage regions than in the transfer regions; a second layer of immobile charge comprised of dopant impurities of said one conductivity type in only the transfer regions of said clocked phase.

4,229,753

VOLTAGE COMPENSATION OF TEMPERATURE COEFFICIENT OF RESISTANCE IN AN INTEGRATED CIRCUIT RESISTOR

David L. Bergeron, Manassas, and Geoffrey B. Stephens, Catlett, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,759
Int. Cl.² H01L *23/56, 29/66, 27/02*
U.S. Cl. 357—28 **4 Claims**



1. A temperature compensated integrated circuit semiconductor resistor, comprising:

a first resistor region of a second conductivity type formed in an epitaxial semiconductor layer of a first conductivity type, having electrical contacts on opposing ends, one of said contacts being connected to a reference potential;

said resistor having a positive voltage coefficient of resistance and a predetermined temperature coefficient;

temperature sensing means formed in proximity to said resistor on said integrated circuit, having a voltage output terminal connected to said epitaxial layer and a second terminal connected to said reference potential;

said temperature sensing means having, on said voltage output terminal, a voltage output characteristic with respect to temperature which varies inversely with respect to the temperature coefficient of resistance of said resistor;

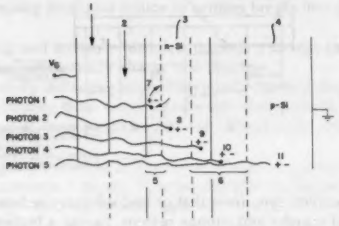
variations in the resistance of the resistor due to temperature changes being compensated for by corresponding changes in the voltage of the epitaxial layer induced by said temperature sensing means.

4,229,754

CCD IMAGER WITH MULTI-SPECTRAL CAPABILITY

Barry T. French, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 26, 1978, Ser. No. 972,761
Int. Cl.[3] H01L *27/14, 29/78*
U.S. Cl. 357—30 **7 Claims**



1. A multi-spectral charge coupled device for generating a plurality of signals representative of the spectral content of impinging photons comprising:

a plurality of adjacent semiconductor layers arranged to generate a hole and an electron for each of said impinging photons;

first and second collector means arranged to respectively collect said generated holes and electrons and respectively generate first and second signals representative of said generated holes and electrons;

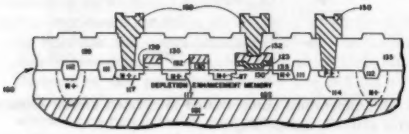
said semiconductor layers having a predetermined optical absorption coefficient and said first and second collector means arranged such that said first and second signals are indicative of the spectral content of the impinging photons.

4,229,755

FABRICATION OF VERY LARGE SCALE INTEGRATED CIRCUITS CONTAINING N-CHANNEL SILICON GATE NONVOLATILE MEMORY ELEMENTS

Frank Z. Custode, Norco, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 15, 1978, Ser. No. 934,223
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—41 **10 Claims**



1. A method of fabricating a very large scale integrated circuit chip comprising at least one silicon gate protected drain-source nonvolatile memory element having a channel of a first conductivity and a two layer silicon dioxide/silicon nitride gate insulator; said chip further comprising at least one insulated gate transistor having single layer silicon dioxide gate insulator; said method comprising the steps of:

(a) providing a silicon wafer including an epitaxial layer of silicon having a second conductivity opposite from said first conductivity;

(b) selectively doping a plurality of regions of the epitaxial layer with dopant ions to change the conductivity of the plurality of regions to the second conductivity, the plurality of regions including at least one first region and one second region respectively corresponding to the source and drain regions of each of at least one protected drain-source non-volatile memory element and at least one third region and one fourth region respectively corresponding to the source and drain regions of each of at least one insulated gate transistor;

(c) selectively applying a first thick layer of silicon dioxide on the surface of the epitaxial layer in a region corresponding to the fixed threshold gate region of each of at least one protected drain-source nonvolatile memory elements;

(d) selectively applying a second thin layer of silicon dioxide on the surface of the epitaxial layer in a region corresponding to the variable threshold gate region of each of at least one protected drain-source nonvolatile memory elements;

(e) selectively applying a layer of silicon nitride on the surface of the first and second silicon dioxide layers;

(f) selectively applying a third thick layer of silicon dioxide on the surface of the epitaxial layer in a region corresponding to the gate region of each of at least one insulated gate transistor;

(g) selectively applying a layer of one of either polycrystalline silicon or metal on at least the surface of the third silicon dioxide layer and the silicon nitride layer;

(h) selectively applying an insulated passivation layer on the surface of the very large scale integrated circuit chip, the passivation layer including windows therein, whereby regions of the chip to be electrically connected to are left exposed;

(i) selectively applying a conductive layer to the surface of the passivation layer and the exposed regions of the chip, wherein electrical connections to the chip are formed.

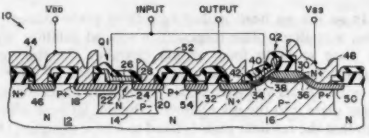
6. A very large scale integrated circuit chip fabricated in accordance with the method of claims **1**, or **2**, or **3**, or **4**, or **5**.

4,229,756

ULTRA HIGH SPEED COMPLEMENTARY MOS DEVICE

Shuichi Sato, Beaverton; Tadanori Yamaguchi, Hillsboro, and Jack Sachitano, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 9, 1979, Ser. No. 10,665
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—42 **8 Claims**



1. A semiconductor device comprising:

a body of semiconductor material having a major surface,

a first metal-insulator-semiconductor field effect transistor formed at a location on said body surface that includes portions of relatively higher and lower elevation joined by a slope,

said first transistor including a first region of one conductivity type extending into said body at said higher surface portion and a second region of the same conductivity extending into said body at said lower surface portion, said first and second regions constituting source and drain regions for the transistor, a thin, implanted layer of the opposite conductivity type having an edge that terminates along said slope intermediate said first and second regions and constitutes a channel region for the transistor, an insulating layer disposed over a portion of the body surface including the region thereof extending between said first and second regions, first and second electrodes making electrical contact with said souce and drain regions, respectively, and a gate electrode disposed on said insulating layer overlying at least the portion of said slope that includes said channel region,

a second, complementary metal-insulator-semiconductor field effect transistor of the double diffusion self-aligned type formed at an adjacent location on said body surface, the surface at said adjacent location being substantially planar,

said second transistor including a spaced-apart pair of regions of said opposite conductivity type extending into said body and constituting source and drain regions for said second transistor, a narrow region of said one conductivity type surrounding said source region, said narrow region being formed by a double diffusion technique and constituting a channel region for said second transistor, an insulating layer disposed over a portion of the body surface including the region thereof extending between said source and drain regions, third and fourth electrodes making electrical contact with said source and drain regions, respectively, and a gate electrode disposed on said insulating layer overlying at least the portion of said surface that includes said channel region.

4,229,757

PROGRAMMABLE MEMORY CELL HAVING SEMICONDUCTOR DIODES

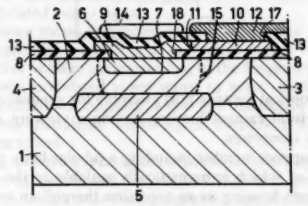
Michel Moussie, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,470

Claims priority, application France, Sep. 30, 1977, 77 29476

Int. Cl.[2] H01L *27/10;* **G11C** *17/06;* **H01L** *29/04*

U.S. Cl. 357—59 **9 Claims**



1. An integrated electrically programmable read only memory cell having at least a first and a second semiconductor diode in back-to-back arrangement, wherein

the first diode is a planar p-n junction formed between two superimposed regions of which at least one region extends on the upper part of a semiconductor body and the second diode is a lateral p-n junction formed between two co-planar zones of a thin layer of a semiconductor material extending locally on an insulating layer covering the said body;

a window in the said insulating layer ensuring a contact between the said layer and the said body at the site of the first diode, and

the area of the junction of the second diode being substantially smaller than that of the first.

4,229,758

PACKAGE FOR SEMICONDUCTOR DEVICES WITH FIRST AND SECOND METAL LAYERS ON THE SUBSTRATE OF SAID PACKAGE

Kouji Ikari, Kokubu, Japan, assignor to Kyoto Ceramic Co., Ltd., Kyoto, Japan

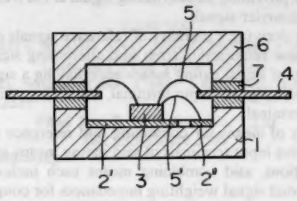
Filed Feb. 9, 1979, Ser. No. 10,623

Claims priority, application Japan, Feb. 8, 1978, 53/15340[U]

Int. Cl.[3] H01L *23/02, 23/12, 39/02*

U.S. Cl. 357—74 **3 Claims**

1. A package for sealing an MOS type semiconductor element having a die-attach area comprising a first metal layer composed of gold and a second metal layer composed of a



metal a good bondability to aluminum metal, which is electrically connected to the first metal layer.

4,229,759

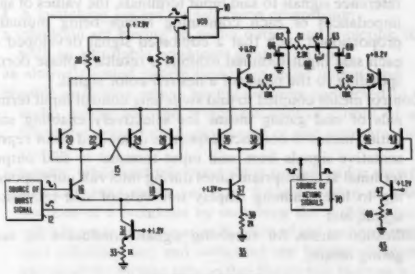
SIGNAL DETECTOR INCLUDING SAMPLE AND HOLD CIRCUIT WITH REDUCED OFFSET ERROR

Leopold A. Harwood, Bridgewater, and Erwin J. Wittmann, North Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,039

Int. Cl.[3] H04N *9/46;* **H03B** *3/04*

U.S. Cl. 358—19 **13 Claims**



1. Electronic signal processing apparatus comprising:

a first source of reference signals;

a second source of signals having a characteristic which is to be sampled;

signal multiplier means having first and second inputs coupled to said first and second sources, respectively, and first and second oppositely phased outputs;

a filter network; and

first and second sampling means operable concurrently between relatively low and high impedance states for alternately coupling said filter network to said multiplier outputs for sampling said characteristic of said signals and for uncoupling said filter network from said multiplier outputs so as to store information representative of said characteristic at said filter network.

4,229,760

VIDEO GAMES COLOR SYNTHESIS

Leslie R. Avery, Leefdaal, Belgium, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,742

Claims priority, application United Kingdom, May 26, 1978, 22986/78

Int. Cl.[2] H04N *9/535*

U.S. Cl. 358—22 **16 Claims**

1. Apparatus for synthesizing color signal information corresponding to color information contained in the chrominance

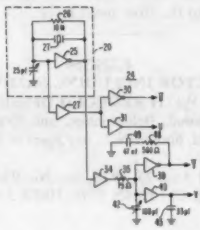
component of a color television signal also including a color synchronizing chrominance subcarrier component, said apparatus comprising:

means for providing an alternating signal at the frequency of said subcarrier signal;

means for deriving a plurality of reference signals in quadrature phase relationship from said alternating signal;

a plurality of signal gating means each having a signal input terminal, a signal output terminal, and a switching control input terminal;

a plurality of means for combining said reference signals at respective input terminals of said gating means in selected proportions, said combining means each including first and second signal weighting impedances for coupling said



reference signals to said input terminals, the values of said impedances of each combining means being mutually proportioned such that a combined signal developed at each said input terminal exhibits a resultant phase corresponding to the phase of a desired color signal;

control means coupled to said switching control input terminals of said gating means for selectively enabling said gating means to conduct respective combined color representative signals from said input terminal to said output terminal at appropriate times during intervals corresponding to line scanning display intervals of said television signal; and

utilization means for receiving signals conducted by said gating means.

4,229,761

ILLUSION TRANSMITTER

Valerie L. Thomas, 7001 Kingfisher La., Lanham, Md. 20801

Continuation-in-part of Ser. No. 824,516, Aug. 15, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 973,886

Int. Cl.[2] **H04N** *9/54, 5/74*

U.S. Cl. 358—90 **1 Claim**

1. A three dimensional illusional television system for transmitting an illusion of an object comprising:

an image transmitter, said image transmitter including a first concave mirror having a focal point and center of curvature for producing real images of an object, an object field disposed about the principle axis of the concave mirror beyond the center of curvature of the concave mirror, an image field disposed about the principle axis and between the center of curvature and focal point of the concave mirror, and image detection means for generating electronic signals from said reflected real images;

a facsimile transmitter for receiving said electronic signals from the image detection means and transmitting said received signals to an image receiver, and;

an image receiver, said image receiver including a second concave mirror having a principle axis, focal point, and center of curvature; a second object field disposed about the principle axis and between the focal point and the center of curvature of said second mirror; and a video image projector disposed in the object field for projecting light rays onto the concave mirror, said projector including means for receiving electronic signals from said facsimile transmitter and producing an image therefrom whereby an illusional image may be viewed beyond the focal point.

4,229,762

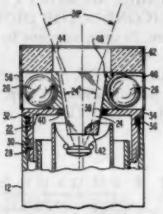
OPTICAL VIEWING PORT ASSEMBLY FOR A MINIATURE INSPECTION TV CAMERA

Lawrence G. Healy, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1979, Ser. No. 4,514

Int. Cl.[3] **H04N** *7/18*

U.S. Cl. 358—100 **6 Claims**



1. An optical viewing port assembly for a miniature cylindrical television camera housing having a viewing axis, which assembly comprises:

(a) a support member including a tubular body portion one end of which is hermetically sealable to the cylindrical camera housing as an extension thereof, an inwardly extending flange portion at the other end of the tubular body portion with a central aperture through the flange portion aligned along the viewing axis, and an annular portion extending from the flange portion in the direction away from the tubular body portion and about the viewing axis;

(b) a high refractive index light transmissive optical plug passing through the central aperture through the flange portion and through the annular portion, which optical plug is supported from and hermetically sealed to the flange portion of the support member along the camera optical axis, which plug has a radial dimension and a thickness, such that when the assembly is connected to the camera housing which includes a camera focus lens and the plug is closely spaced from the lens, the camera field of view is reduced along the plug without reducing the usable camera image area, which plug extends for a distance along the optical axis sufficient to permit a relatively high power miniature light source to be mounted and spaced radially about the plug so that the light source is not within the camera field of view; and

(c) at least one relatively high power miniature light source mounted from the support member and disposed about the support member annular portion and the optical plug, with electrical connection means hermetically and insulatingly sealed through the flange portion of the support member to provide electrical connection to one terminal of the light source, and wherein the support member is conductive and is connected to the other terminal of the light source as the electrical return.

4,229,763
OPTICAL HIGH DENSITY FM RECORDING DEVICE WITH CORRECTIVE SIGNAL

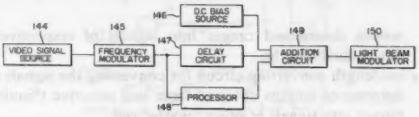
Takao Tsuji, Kawasaki; Takeshi Goshima, Tokyo, and Hideaki Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 614,184, Sep. 17, 1975, abandoned. This application Jul. 7, 1978, Ser. No. 922,645

Claims priority, application Japan, Sep. 20, 1974, 49-108567

Int. Cl.[2] G11B *11/00, 7/00;* **H04N** *5/76*

U.S. Cl. 358—128.5 **7 Claims**



1. An optical high density recording device comprising:

(a) laser beam modulating means for forming a laser beam modulated in accordance with a modulating signal applied thereto;

(b) a recording medium onto which the modulated laser beam obtained from said laser beam modulating means is irradiated, wherein the beam-irradiated portions of said medium are recorded in the form of undulations in accordance with the irradiated beam;

(c) means for moving said recording medium and the beam irradiated onto said recording medium relative to one another;

(d) a video signal generating means for generating a frequency-modulated video signal;

(e) processing means connected to said video signal generating means for generating a corrective signal having a corrective voltage corresponding to the frequency of said frequency-modulated video signal to make the height of said undulations constant when the frequency of said frequency-modulated video signal exceeds a particular frequency; and

(f) adding means for adding an output from said video signal generating means and an output from said processing means to form a modulating signal for application to said modulating means.

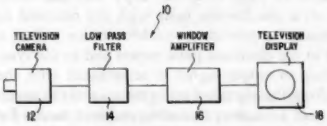
4,229,764
VISIBILITY EXPANDER

Michael Danos, 407 Muddy Branch Rd., Gaithersburg, Md. 20760

Continuation-in-part of Ser. No. 896,208, Apr. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 751,680, Dec. 17, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,886

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—160 **36 Claims**



1. A picture visibility expander system comprising a viewing device for producing signals indicative of that which is viewed thereby, a display device, a low pass filter means connected to receive said signals and filter out high frequency components therefrom, a window amplifier connected to receive filtered signals from said low pass filter, said window amplifier having means for expanding the amplitude differences of those of said filtered signals lying in a predeterminable amplitude range, and means for supplying said signals processed by said window amplifier to said display device.

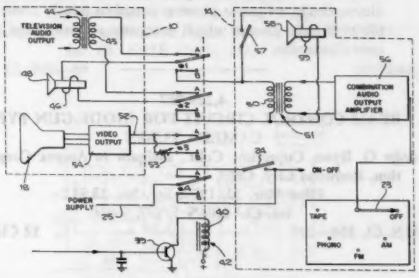
4,229,765
REMOTE AUDIO AND BRIGHTNESS CONTROL CIRCUIT FOR TELEVISION

Winston D. Sanger, 12600 Cuddy Valley Rd., Frazier Park, Calif. 93225

Filed Jan. 5, 1979, Ser. No. 1,220

Int. Cl.[3] H04N *5/44*

U.S. Cl. 358—188 **7 Claims**



1. A switching system for television comprising:

a television set having an audio output and a picture tube with an adjustable brightness control circuit;

an alternate sound system having an audio output; and

bistable switching means having contacts connected to the audio output and the brightness control circuit of said television set and the audio output of said alternate sound system;

whereby, while said television set is turned on for viewing, said switching means provides for eliminating undesired portions of a broadcast by switching the audio output of said alternate sound system in place of the audio output of said television set, and switching the brightness control circuit of the picture tube so that the picture thereon is just barely discernible.

4,229,766
SCANNING APPARATUS AND METHOD FOR OPERATING THE APPARATUS

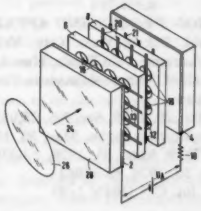
Balint Sipos, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,111

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720235; May 5, 1977, 2720261

Int. Cl.[2] H04N *5/30, 5/66*

U.S. Cl. 358—209 **12 Claims**



1. In apparatus which contains a cathode for electron emis-

sion and an anode on which the electrons impinge, an improved scanning system comprising:

(a) at least one hole matrix having therein a plurality of holes, arranged in rows and columns, disposed between the cathode and the anode for row and column control of the electron stream; and

(b) at least two separately controllable sets of electrodes disposed in at least two different planes parallel to the plane of said hole matrix for control of the holes in said matrix, with the electrodes in one of said planes arranged in plurality of groups each group comprising electrodes which are at a predetermined spacing from each other, said spacing being at least three rows or three columns, each of said groups being jointly controllable and the electrodes in a further plane grouped in jointly controllable electrode groups which comprise at least three adjacent electrodes.

4,229,767

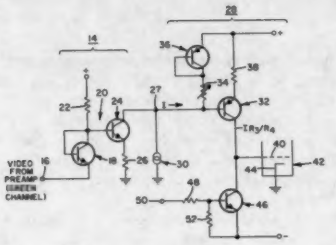
BEAM CONTROL CIRCUIT FOR DIODE-GUN TYPE CAMERA TUBES

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 23, 1979, Ser. No. 23,512

Int. Cl.[2] H04N *5/197, 9/09*

U.S. Cl. 358—219 **12 Claims**



1. In a camera pickup tube having a substantially linear relationship between the grid current and the beam current thereof, a control circuit for controlling the beam current with respect to a video signal current, comprising the combination of;

highlight enable means coupled to the video signal current and pre-biased to a given upper limit of a normal video signal current operating range;

tube grid control means coupled to the grid and including means for pre-calibrating a relationship between the video signal current and any change in the beam current caused thereby; and

said tube grid control means is responsive to the highlight enable means in the presence of highlights, to generate increases in beam current which maintain a selected margin corresponding to the pre-calibrated relationship.

4,229,768

INFORMATION PROCESSING APPARATUS

Sadasuke Kurahayashi, Tokyo; Yuzo Kato, Yokohama; Asao Watanabe, Higashikurume; Shin Tsuda, Hasuda, and Hakaru Muto, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,082

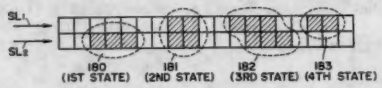
Claims priority, application Japan, Mar. 30, 1978, 53-37078; Mar. 30, 1978, 53-37079; Mar. 30, 1978, 53-37080; Mar. 30, 1978, 53-37081; Mar. 30, 1978, 53-37082

Int. Cl.[2] H04N *1/40*

U.S. Cl. 358—261 **35 Claims**

1. Information processing apparatus, comprising: scanning means for obtaining binary image signals representing two light levels by scanning an original on which an image is recorded;

a selective thinning circuit for converting the signals representing either one light level in said binary image signals obtained by scanning operation by said scanning means and having a length in a principal scanning direction



within determined ranges into signals of respectively determined lengths;

a run-length converting circuit for converting the signals of determined lengths obtained from said selective thinning circuit into signals of other lengths; and

a one-dimensional coding circuit for encoding the signals thus converted by said run-length converting circuit.

4,229,769

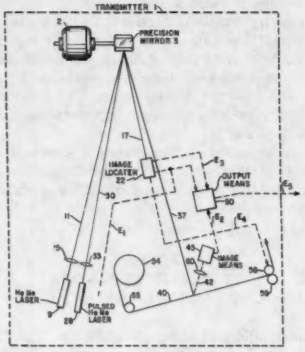
FACSIMILE SYSTEM

Robert W. Pitts, Jr., Houston, Tex., and Ronald G. Gillespie, Old Tappan, N.J., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,326

Int. Cl.[2] H04N *1/04, 1/36, 1/00, 1/24*

U.S. Cl. 358—285 **15 Claims**

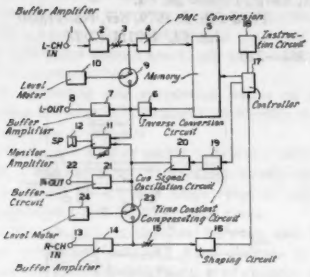


1. A facsimile system comprising a transmitter including scanning means for scanning an original copy and periodically providing pulses of light impinging the copy during the scan, light responsive means spacially related to the copy for receiving pulses of light from the copy and providing electrical pulses on a one-for-one basis with the received light pulses, sync means for providing synchronization pulses, means connected to the electrical pulse means and to the sync means for providing an output signal in accordance with the electrical pulses from the electrical pulse means and the synchronization pulses, and a receiver including receiver means for receiving the output signal and providing electrical data pulses and synchronization pulses in accordance with the received output signals, light sensitive material, control signal means connected to the receiver means for providing a control signal in accordance with the electrical pulses from receiver means, laser means for scanning the material and providing pulses of light which strike the material in accordance with the control signal, and means for developing the material so as to provide a printed copy of the original copy.

4,229,770
METHOD OF RECORDING ON A MAGNETIC TAPE WHICH IS ATTACHED TO A CARD

Takamasa Ito, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 2, 1979, Ser. No. 8,767
Claims priority, application Japan, Feb. 10, 1978, 53/13416
Int. Cl.[2] G11B *5/86*
U.S. Cl. 360—15 **5 Claims**

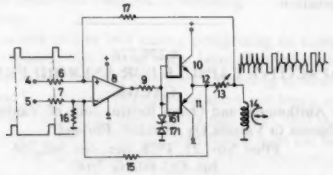


1. A recording method for a magnetic tape attached to a card, in which an audio signal from a master recorder is pulse coded by a PCM converting circuit and stored in a solid memory of a predetermined capacity, and this stored signal is read out repeatedly by a control signal, again converted into an analog audio signal and recorded on one of the channel tracks of the magnetic tape in each slave side recorder while the cue signal formed at a predetermined timing relative to said audio signal is recorded repeatedly on the other channel track of said magnetic tape.

4,229,771
METHOD OF RECORDING A CONTROL SIGNAL ADJACENT ANOTHER SIGNAL TRACK ON A MAGNETIC RECORDING MEDIUM, AND SYSTEM THEREFOR

Richard Heinz, Pfungstadt, and Bernd Heidel, Dieburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 12, 1978, Ser. No. 968,729
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827826
Int. Cl.[3] G11B *5/09, 5/02*
U.S. Cl. 360—46 **10 Claims**



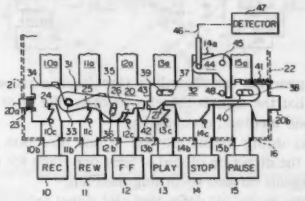
1. In a method of recording electrical pulse-type control signals on a track of a magnetic recording medium, in which at least one other signal is recorded in a track parallel to the control track carrying said control signals, a method to reduce cross talk between the control signals and said adjacent track which comprises

recording the control signals in form of pulse pairs of essentially square wave pulses, in which the pulses of the pairs are immediately adjacent and have respectively opposite polarity, and the pulse pairs are spaced from each other by pulse gaps which are long with respect to the duration of the individual pulses of the pair to provide control signals which have, in Fourier distribution, a frequency spectrum in which frequencies higher than said control signals form a substantial component of the signal whereby crosstalk between the control signals and said adjacent track is reduced.

4,229,772
TAPE RECORDER HAVING AN AUTOMATIC MODE SWITCHING MECHANISM

Hiroshi Muramatsu, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 5, 1979, Ser. No. 17,601
Claims priority, application Japan, Mar. 6, 1978, 53/28235[U]
Int. Cl.[2] G11B *15/02, 15/18, 15/44*
U.S. Cl. 360—69 **3 Claims**



1. A tape recorder having means for detecting an index signal recorded on a tape, and means for feeding said tape at high and low selectable speeds, comprising:

first and second latch bars each having a pin and longitudinally movable respectively in response to a manually applied pressure from a normal position to an operative position to cause said tape to feed at said low and high speeds respectively;

a crosspiece member intersecting said first and second latch bars and movable in the lengthwise direction thereof and having first and second notches in positions to engage the pins of said first and second latch bars respectively, the first notch having a greater depth of cut in the lengthwise direction of said crosspiece member than that of said second notch, whereby the pins of said first and second latch bars engage respectively the first and second notches of said crosspiece member in response to said manually applied pressure;

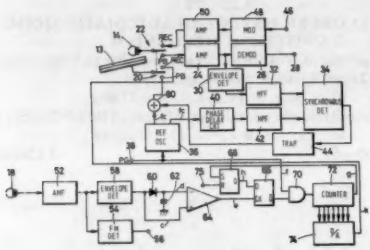
a first abutment member on said crosspiece member and movable from a normal position to an operative position in response to the movement of said second latch bar to its operative position; and

a second abutment member on said crosspiece member and movable in the lengthwise direction of said crosspiece member in response to an output signal from said index detecting means to engage said first abutment member in its operative position to cause said crosspiece member to move a distance which is greater than the depth of cut of said second notch and smaller than the depth of cut of said first notch to disengage the pin of the second latch bar from said second notch to thereby cause said second latch bar to return to its normal position causing said first abutment member to return to its normal position and movable in response to a subsequent output signal from said index detecting means to engage said first abutment member in its normal position to cause said crosspiece member to move a distance which is greater than the depth of cut of said first notch to disengage the pin of the first latch bar from said first notch.

4,229,773
VIDEO SIGNAL RECORDING SYSTEM WITH AUTOMATIC HEAD POSITIONING

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 7, 1978, Ser. No. 967,100
Claims priority, application Japan, Dec. 12, 1977, 52-148062
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—70 **11 Claims**



1. An apparatus for recording signals on a recording medium, so that the signals thereby recorded lie in at least one track on said medium, comprising:

signal recording means moving in one direction generally along the direction of said at least one track for recording said signals on said recording medium;

deflectable means for deflecting said signal recording means normal to said one direction in response to a control signal;

means for generating said control signal;

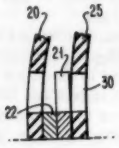
means for finding, during commencement of the recording of said signals, the value of said control signal which produces substantial coincidence between the deflected position of said signal recording means and an optimum location of said at least one track; and

means for storing said value of the control signal and applying the same to said deflectable means during recording subsequent to said commencement.

4,229,774
SELF-ADAPTING FLOW RESTRICTORS

Donovan M. Janssen, Boulder, Colo.; Anton J. Radman, Jr., Tucson, Ariz., and William S. Seaward, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1979, Ser. No. 44
Int. Cl.³ G11B *5/016, 15/64*
U.S. Cl. 360—98 **4 Claims**



1. The method of operating a record storage apparatus having a plurality of axially spaced apart flexible storage disks with somewhat uniform axial interstices therebetween with transducer access being achieved by axially enlarging one of said axial interstices,

the steps of:

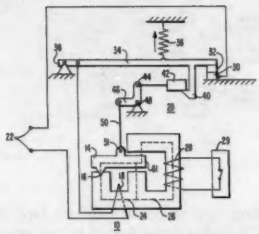
reducing air flow between storage disks adjacent said transducer accessing enlarged interstice as a function of the axial spacing from said enlarged interstice, the closer the disk interstice is to said enlarged interstice, the greater the reduction of air flow, and

adjusting said air flow reductions in accordance with environmental atmospheric conditions.

4,229,775
CIRCUIT BREAKER MAGNETIC TRIP DEVICE WITH TIME DELAY

Robert C. Miller, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1979, Ser. No. 11,020
Int. Cl.³ H01H *47/18*
U.S. Cl. 361—210 **14 Claims**



1. A tripping device for a circuit interrupter, comprising:

a core member of magnetic material;

an armature of magnetic material disposed in relationship to said core member to complete first and second magnetic circuits, said armature being movable between normal and tripped positions, movement to the tripped position being operable to trip an associated circuit interrupter;

a primary winding coupled to said core member and carrying load current to an associated circuit interrupter, whereby said load current produces magnetic flux in said first and second circuits causing magnetic forces to act on said armature and maintain said armature in the normal position during normal load current conditions;

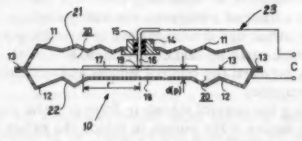
a secondary winding disposed about a part of said second circuit not in common with said first circuit, said secondary winding producing an output proportional to said load current; and

means for shunting said secondary winding upon overload current conditions, whereby the magnetic flux in said second circuit is altered so as to unbalance the forces upon said armature and cause said armature to move to the trip position.

4,229,776
CAPACITIVE CAPSULE FOR ANEROID PRESSURE GAUGE

Veijo Antikainen, and Osmo Reittu, both of Vantaa, Finland, assignors to Vaisala Oy, Finland, Finland

Filed Nov. 21, 1978, Ser. No. 962,786
Int. Cl.² H01G *7/00*
U.S. Cl. 361—283 **5 Claims**



1. An aneroid capsule apparatus for use in a pressure gauge comprising:

a first membrane having a peripherally extending side edge region;

a second membrane having a peripherally extending side edge region and a charge retaining region, said first and second membranes extending substantially parallel to and at a distance from each other and being sealingly engaged to each other along their respective peripherally extending side edge regions to define a sealed interior space between them which is partially evacuated;

means passing through said first membrane and extending between said sealed interior space and the exterior of said capsule apparatus for supporting a capacitor element within said sealed interior space, said support means being electrically conductive;

means for mounting said supporting means on said first membrane in electrically insulated relationship thereto for movement therewith; and

a capacitor element located within such sealed interior space affixed to and supported by said electrically conductive support means in opposed relationship to said charge retaining region of said second membrane,

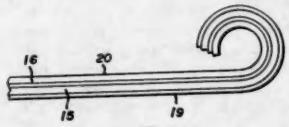
whereby the changes in distance between said first and second membranes resulting from changes in ambient pressure are measured as a function of changes in capacitance of the capacitor plate and opposed charge retaining region of said second membrane.

4,229,777

HIGH VOLTAGE DUAL DIELECTRIC CAPACITOR ROLL

Richard C. Merrill, and Richard G. Conners, both of Glens Falls, N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,658
Int. Cl.³ H01G 4/22
U.S. Cl. 361—314 **9 Claims**



1. A round roll capacitor having a rating from about 250 volts AC to about 440 volts AC comprising:

(a) a casing,

(b) a capacitor roll in said casing comprising an elongated sheet of plastic film having a first layer of metallization on a first side thereof, said first layer extending substantially to a first longitudinal edge of said sheet and being spaced from a second longitudinal edge of said sheet, said sheet of film having a second layer of metallization on the second side thereof, said second layer extending substantially to said second longitudinal edge of said sheet and being spaced from said first longitudinal edge;

(c) one or more sheets of metallization free paper substantially adjacent to said film;

(d) a round core in said roll on which said sheets of film and paper are tightly rolled to form a capacitor roll wherein the film and the paper are in the dielectric field;

(e) an impregnant having a dielectric constant above about 3 in said roll; and

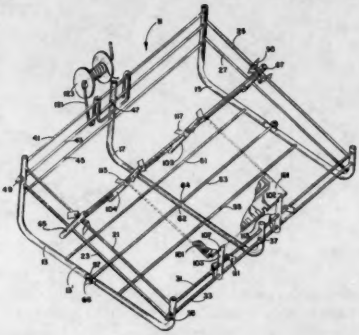
(f) said impregnated roll having essentially a zero space factor after impregnation and the design voltage stress on said paper is above about 500 volts per mil thickness and above about 1000 volts per mil thickness on said film.

4,229,778

UNIVERSAL CIRCUIT BOARD HOLDING APPARATUS FOR FACILITATING ASSEMBLY OF COMPONENTS

Ernest E. Williams, Fullerton, and William M. Brennan, Chino, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1979, Ser. No. 24,275
Int. Cl.² H05K 13/04
U.S. Cl. 361—399 **7 Claims**



1. A universal circuit board holding apparatus comprising; in combination:

a frame;

side rails and front and rear rails comprising said frame;

adjustably positionable rails extending across said frame between the side rails and movable in the direction of the front and rear rails;

means comprising releasable clamping means engaging said side rails and said adjustably positionable rails for permitting movement of the adjustably positionable rails along the side rails when released and for locking the adjustably positionable rails to the side rails when clamping;

board supports carried by the adjustable rails and one of the rear rails and the front rails, and

releasable clamps positionably fixing said supports to said rails while permitting movement therealong to accommodate various sized boards.

4,229,779

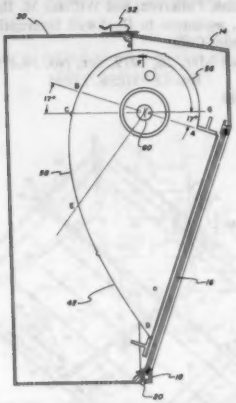
LUMINAIRE WITH ARCUATE REFLECTOR

Edward B. Bilson, and Alfred H. Brown, III, both of Memphis, Tenn., assignors to International Telephone and Telegraph Corporation, Chicago, Ill.

Filed May 19, 1978, Ser. No. 907,499
Int. Cl.² F21V 7/12
U.S. Cl. 362—217 **8 Claims**

1. A luminaire adapted to illuminate a surface spaced from an elevated mounting of said luminaire, said luminaire including an elongated substantially horizontal tube light source, a concave, elongated reflector circumposed about said light source for reflecting light from said source, the invention wherein said reflector produces a plurality of parallel beams of light emanating from said light reflected within said luminaire, each said beam encompassing approximately one degree of exit angle to illuminate a portion of the surface, said reflector configured to produce light of substantially uniform intensity across said surface for a distance encompassed by said beams in which said reflector is comprised in profile of a first portion and a second portion, said first portion comprising a smooth continuous curve generated by adjoining cylindrical sections of successively increasing radii in the direction toward said

second portion and said second portion comprising adjoining sections, each having the optical characteristics of a parabola



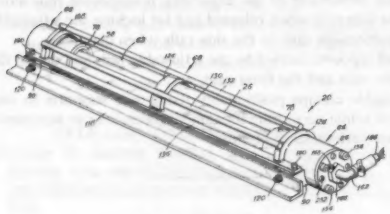
with each successive parabola being of successively increasing focal length in the direction away from said light tube.

4,229,780

FLUORESCENT LAMP FOR USE IN EXPLOSIVE ATMOSPHERES SUCH AS MINES

Robert C. Nelson, Bluefield, W. Va., assignor to West Virginia Armature Company, Glen Lyn, Va.

Filed Jun. 27, 1978, Ser. No. 919,662
Int. Cl.[2] H05B *33/02*
U.S. Cl. 362—218 **6 Claims**



1. A lamp permissible for use in explosive atmospheres such as mines comprising:

an elongated lighting assembly and a guard assembly therefor;

said lighting assembly including an elongated bulb characterized by a luminous envelope having hot luminous regions at the end portions thereof;

said guard assembly including a light-transmitting tube enclosing said bulb, and metal end housings at opposite ends of said tube, each metal end housing having integral therewith a continuous cylindrical sleeve completely surrounding an end portion of said lighting assembly, each said sleeve being located adjacent and axially displaced from the corresponding one of said hot luminous regions to enable said hot luminous regions to transmit light directly outwardly therefrom through end portions of said light-transmitting tube;

said sleeves having first cylindrical bearing surfaces, said light-transmitting tube having heat-conductive metal bushings fastened thereto at opposite ends thereof and in heat-conductive relation therewith, said bushings having second cylindrical bearing surfaces assembled in contiguous, lapping, heat-conductive, telescopically slidable relationship with said first bearing surfaces to enable relative thermal expansion and contraction of their associated parts; and

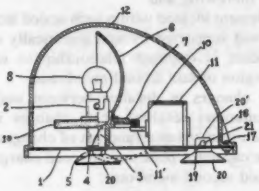
said sleeves being located sufficiently closely adjacent said hot luminous regions to act as heat sinks thereby diverting heat from said tube through said metal bushings into the metal end housings to maintain the temperature of the tube at a safe level.

4,229,781

BEAM-ROTARY LAMP

Shozo Hitora, Nara, Japan, assignor to Sasaki Electric Manufac. Co. Ltd., Osaka, Japan

Filed Jan. 5, 1979, Ser. No. 1,277
Int. Cl.[3] F21V *21/26*
U.S. Cl. 362—274 **4 Claims**



1. A beam-rotary lamp comprising a substantially egg-shaped chassis; a transparent bowl-shaped globe, said globe being fixed to said chassis and defining therewith an enclosed space having a front and a rear portion, said rear portion being of less height and narrower than said front portion; a lamp unit including a lamp, a reflector and a rotor, said reflector being supported by said rotor, said rotor being arranged substantially horizontally and said lamp unit being positioned in said front portion of said space; a power unit located in said rear portion of said space, said power unit including a motor having a horizontally extending drive shaft; a socket, said lamp being set into said socket; a supporting boss projecting vertically downward from said boss and fixed to said chassis, said rotor being slidably, rotatable positioned over said boss for rotation about a vertical axis, said rotor having a round brim; a rubber ring positioned on said brim; and a corrugated spring washer positioned about said boss to maintain said rubber ring in friction contact with said horizontally extending drive shaft.

4,229,782

HIGH EFFICIENCY LIGHTING UNITS WITH BEAM CUT-OFF ANGLE

Alan J. Ruud, West Allis, Wis., and Ian Lewin, Scottsdale, Ariz., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Dec. 20, 1977, Ser. No. 862,579
Int. Cl.[2] F21V *7/00*
U.S. Cl. 362—297 **13 Claims**

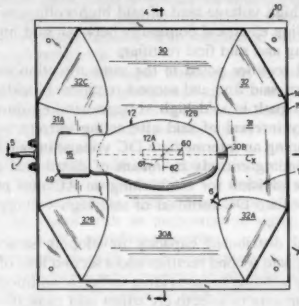
1. In a lighting unit:

an elongated lamp having a longitudinally extending axis;

and a lamp reflector comprising at least two reflector surfaces each having first and second spaced ends, the first ends of said reflector surfaces joining each other along a line located in a plane behind and spaced from said lamp, said line of joinder of said first ends of said reflector surfaces extending substantially parallel to the longitudinal axis of said lamp, the second ends of said reflector surfaces extending outwardly and away from said lamp at the front thereof, said second ends being spaced from each other and lying in a plane spaced from the plane in which said first ends of said reflector surfaces lie and defining the reflector opening,

at least one of said reflector surfaces being curved; each point on the curve of said one reflector surface being defined by a plane extending transverse to the longitudinal

axis of said lamp, said points on said curved reflector surface being spaced farther from the longitudinal axis of said lamp than said line of joinder of said first ends of said



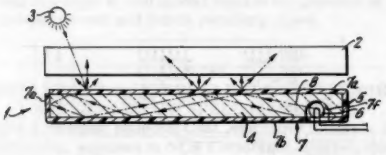
reflector surfaces, with some points on said curve being located on the side of said lamp opposite said line of joinder of said first ends of said reflector surfaces.

4,229,783

BACKLIGHT FOR ELECTROOPTIC DISPLAY

Noel Eberhardt, Cupertino, Calif., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 12, 1979, Ser. No. 19,698
Int. Cl.[3] F21V *1/06*; G01D *11/28*
U.S. Cl. 362—352 **3 Claims**



1. In an illuminated electrooptic display of the type having a backlight member disposed beneath a passive light transmissive electrooptic display, the improvement in said backlight comprising:

a flat substantially transparent light transmitting member having opposed first and second parallel surfaces and having edge portions, said light transmitting member defining a recess opening in at least one of said surfaces,

a thin sheet of transluscent material completely enveloping said light transmitting member covering said first and second surfaces and said edges and adhered to by an adhesive, said transluscent material comprising a foldable sheet of material selected from the group consisting of polypropylene or polystyrene, and defining a hole adapted to be aligned with said recess when the sheet is folded to envelop the light transmitting member; and

a light source disposed in said recess.

4,229,784

LAMPSTAND FOR LAMPSHADE

Isamu Noguchi, 333 E. 69th St., New York, N.Y. 10021

Division of Ser. No. 850,790, Nov. 11, 1974. This application Apr. 5, 1979, Ser. No. 27,361
Int. Cl.[2] F21S *1/12*
U.S. Cl. 362—414 **3 Claims**

1. A fixture for supporting a lampshade, said fixture comprising:

A. a vertical pole having a socket attached to its upper end to receive a light bulb;

B. a harp constituted by a symmetrical array of at least three U-shaped wires arranged to encage said bulb, each wire having a vertical arm and horizontally-extending lower and upper legs, the lower legs being joined to a lower ring

attached to said pole at a point below the socket, the upper legs being joined to an upper ring in axial alignment with the pole; and

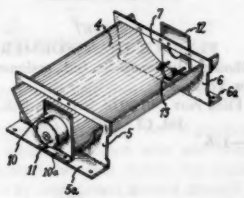
C. an extension rod anchored in said upper ring and extending upwardly therefrom to provide a mounting for said lampshade.

4,229,785

FLOODLIGHT REFLECTOR MOUNTING

Clarence J. Tuller, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 18, 1979, Ser. No. 4,339
Int. Cl.[2] F21V *17/06*
U.S. Cl. 362—433 **7 Claims**

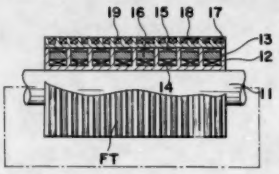


1. A lighting fixture comprising, in combination, a housing having a window, a plurality of spaced cradle members mounted in said housing adjacent said window, each cradle member formed with an opening having a portion of predetermined shape, and a flexible reflector member inserted at opposite sides into the openings of said spaced cradle members and arranged facing said window, said cradle members holding said reflector member in said predetermined shape, said openings of said cradle members each being defined by a rear cradle portion for shaping said reflector and front cradle portions for holding said reflector against said rear cradle portion.

4,229,786
FLY-BACK TRANSFORMER WITH A LOW RINGING RATIO

Yutaka Mitani, Nagaokakyo; Katumi Tokuda, Nanao, and Saburo Kitao, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Inc., Japan

Filed Sep. 19, 1978, Ser. No. 943,678
Claims priority, application Japan, Sep. 26, 1977, 52/115850; Oct. 18, 1977, 52-125625; Nov. 30, 1977, 52-144716; Dec. 13, 1977, 52-150317; Dec. 21, 1977, 52-154707
Int. Cl.[3] H01J *29/70*
U.S. Cl. 363—126 **23 Claims**



1. A fly-back transformer for use in a horizontal deflection circuit of a television receiver, the operation of said deflector circuit being cyclical, and each cycle of said circuit being divided into a scanning period and a retract period, said transformer comprising:

a core member;

a first coil bobbin provided on said core member;

a primary winding for low voltage supply mounted on a second coil bobbin located on said first coil bobbin;

a secondary winding for producing a high-voltage output responsive to an electromagnetic field generated by said core and located on said second coil bobbin;

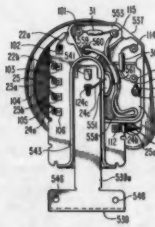
a tertiary winding for generating a low-voltage output responsive to an electromagnetic field generated by said core and located at a position wherein the magnetic coupling of said tertiary winding to said primary winding is small in comparison with the magnetic coupling of said tertiary to said secondary winding, and wherein the leakage flux of said secondary winding with respect to said primary winding interlinks with said tertiary winding; and

a commutating circuit connected to said tertiary winding so as to commutate the output of said tertiary winding only during said scanning period of said horizontal deflection circuit.

4,229,787
FLYBACK TRANSFORMER

Leslie N. Thibodeau, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,109
Int. Cl.[2] H02M *7/06*
U.S. Cl. 363—126 **5 Claims**



1. A high voltage structure, comprising:

a high voltage winding adapted for coupling to a source of alternating current voltage for developing a high voltage in said high voltage winding;

a first rectifier poled to conduct current;

high voltage termination means connecting said first rectifier and a high voltage lead of said high voltage winding for providing electrical continuity between said high voltage winding and said first rectifier;

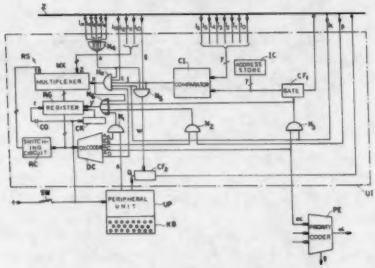
a second rectifier poled in the same direction as said first rectifier, said first and second rectifiers blocking the DC current path in said high voltage winding during a first polarity interval of said alternating current voltage for developing an intermediate DC voltage in said high voltage winding entirely by means of distributed capacitive voltage division for establishing an AC null point at an intermediate DC terminal of said high voltage winding; and

additional distributed capacity developing structure connecting said second rectifier and a second lead of said high voltage winding for providing sufficient additional distributed capacity to selectively adjust said capacitive voltage division for selectively adjusting the value of said intermediate DC voltage.

4,229,788
INTERFACE UNIT FACILITATING COMMUNICATION BETWEEN DATA PROCESSOR AND PROGRAM-INTERRUPTING PERIPHERAL UNIT

Armando Consigli, Milan, and Roberto Danna, Cinisello Balsamo, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jun. 6, 1978, Ser. No. 913,232
Claims priority, application Italy, Jun. 6, 1977, 24387 A/77
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—200 **2 Claims**



1. An interface unit for facilitating communication in an electronic data-handling system between a processor having a program memory and one of a plurality of peripheral units adapted to transmit data to said processor, the latter being provided with preferential circuitry for assigning different priority ratings to certain of said peripheral units and being programmed to emit a succession of instructions respectively directed to said peripheral units for inviting the transmission of data available thereat, such data transmission requiring an interruption of the program of the processor, the latter having two output leads carrying a two-bit portion of an input/output instruction generated by said program memory, said interface unit comprising:

a register for the storage of first, second, third and fourth bit combinations respectively representing a plurality of states including a preparatory state, an intermediate state, an active state and a quiescent state;

a decoder connected to an output of said register for respectively converting said first, second, third and fourth bit combinations into a first switching signal denoting said preparatory state, a second switching signal denoting said

intermediate state, a third switching signal denoting said active state and a fourth switching signal denoting said quiescent state;

loading means with input connections to said decoder and to said output leads of the processor for entering said first bit combination in said register upon coincidence of said fourth switching signal with an instruction addressing the associated peripheral unit;

first gating means with input connections to said decoder and to the associated peripheral unit for emitting an enabling signal to said register upon coincidence of said first switching signal with a data-ready signal from said associated peripheral unit;

second gating means with input connections to said decoder and to said preferential circuitry for emitting an enabling signal to said register upon coincidence of said second switching signal with an authorization signal indicating the absence of overriding priorities;

third gating means with input connections to said decoder and to the processor for emitting an enabling signal to said register upon coincidence of said third switching signal with a confirmation signal indicative of a program interruption, said third gating means also establishing a path for the transmission of the address of the associated peripheral unit to the processor preparatorily to the initiation of direct communication therebetween;

a binary incrementer connected to the output of said register for converting said first, second and third bit combinations into said second, third and fourth bit combinations, respectively; and

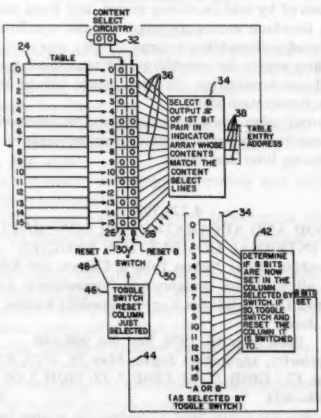
feedback means connecting said incrementer to said register for entering therein the converted bit combinations in response to the enabling signal from any of said gating means, said feedback means including a multiplexer with a first input connected to said incrementer and a second input connected to said output leads of the processor, said multiplexer being switchable by said loading means from said first input to said second input in the presence of said instruction and said fourth switching signal.

4,229,789

SYSTEM FOR TRANSFERRING DATA BETWEEN HIGH SPEED AND LOW SPEED MEMORIES

Douglas J. Morgan, Stanford, Calif., and Barry S. Manis, Fairfield, Conn., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 22, 1977, Ser. No. 863,637
Int. Cl.[3] G11C *9/06*; G06F *13/00*
U.S. Cl. 364—200 **5 Claims**


CONTENT SELECT CIRCUITRY
TABLE
SELECT B OUTPUT OF 1ST BIT PAIR IN INDICATOR ARRAY WHOSE CONTENTS MATCH THE CONTENT SELECT LINES
TABLE ENTRY ADDRESS
RESET A SWITCH
RESET B
TOGGLE SWITCH RESET COLUMN JUST SELECTED
DETERMINE IF B BITS ARE NOW SET IN THE COLUMN SELECTED BY A BITS SET
A OR B (AS SELECTED BY TOGGLE SWITCH)

1. A data processing system, comprising:

a low speed, large scale store, said low speed store having a plurality of memory locations for storing blocks of digital information;

a high speed store having memory locations for storing a limited number of the blocks stored in said low speed store;

a high speed data handling apparatus connected to receive information from said high speed store;

means providing an "A" single bit register and a "B" single bit register associated with each block in said high speed store;

means for initially inserting a usage bit in each "A" register as information is accessed from its associated block;

means for sensing when approximately fifty percent of said "A" registers contain usage bits, and in response clearing said "B" registers and thereafter inserting usage bits into said "B" registers;

means for sensing when approximately fifty percent of said "B" registers contain usage bits, and in response clearing said "A" registers and thereafter inserting usage bits into said "A" registers;

means for selecting a block in said high speed store for replacement by sensing the lack of usage bits in said "A" and said "B" registers associated with specific blocks; and

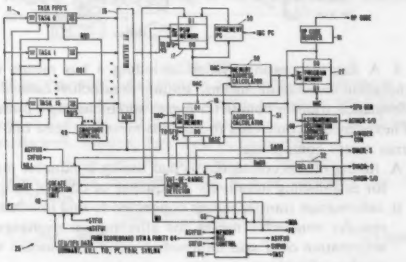
means for transferring information between said high speed store and said low speed store into one of the selected blocks in said high speed store.

4,229,790

CONCURRENT TASK AND INSTRUCTION PROCESSOR AND METHOD

Maxwell C. Gilliland; Burton J. Smith, both of Denver, and Gary L. Ferguson, Boulder, all of Colo., assignors to Denelcor, Inc., Denver, Colo.

Filed Oct. 16, 1978, Ser. No. 951,548
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **46 Claims**



1. A concurrent task and instruction processing device, comprising:

task processing means including control pipeline means and sequencing means connected with said control pipeline means to control the input thereto for sequentially processing tasks by components thereof through said control pipeline means, said sequencing means including memory means and component selection means connected with said memory means to cause selected components to be withdrawn from said memory means and sequenced through said control pipeline means, said memory means including at least one of a task status word memory and a process status word memory, and said component selection means including indicator storage means and selector means connected with said indicator storage means for selecting indicators and coupling the same to said at least one of said task status word memory and said process status word memory for causing an output therefrom to said control pipeline means, whereby said control pipeline means provides multiple sequential output instructions

determined by said task components processed therethrough; and

data processing means including data storage means and function execution means, said data processing means being controlled by said output instructions from said task processing means so that said function execution means, responsive to said output instructions, causes data in said data storage means to be withdrawn therefrom and acted upon by said function execution means concurrently with task component processing through said control pipeline means.

4,229,791

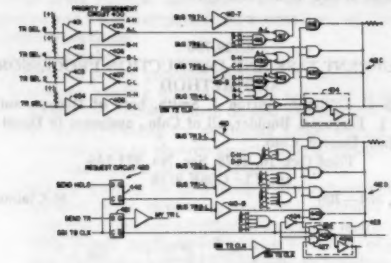
DISTRIBUTED ARBITRATION CIRCUITRY FOR DATA PROCESSING SYSTEM

John V. Levy, Palo Alto, Calif.; David Rodgers, Acton, Mass.; Robert E. Stewart, Stow, Mass.; David Potter, Pepperell, Mass., and Richard J. Casabona, Stow, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 845,415, Oct. 25, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,456

Int. Cl.[3] **G06F** *9/46*

U.S. Cl. 364—200 **16 Claims**



1. A data processing system including a bus means with arbitration conductor means, timing conductor means and information transfer conductor means and including a plurality of nexus means connected to said bus means, at least one said nexus means comprising:

A. timing means connected to said timing conductor means for establishing iteratively a sequence of control states,

B. information transfer means connected to said information transfer conductor means for affecting an exchange of information over said information conductor means with another of said nexus means,

C. priority assignment means for establishing for said nexus means a priority level that is unique to said nexus means,

D. request means connected to said timing means and said information transfer means for generating during a first control state a priority request signal onto said arbitration conductor means when said information transfer means is prepared to affect an exchange of information, said priority request signal having a priority corresponding to the priority level established for said nexus means by said priority assignment means,

E. priority receiver means connected to said arbitration conductor means for receiving at least the priority request signals from all said other nexus means having a higher priority than said nexus means, and

F. comparison means connected to said priority receiver means, said priority assignment means and said timing means for enabling said information transfer means to affect an information exchange when said nexus means generates a priority request signal having the highest priority level during a given sequence of control states.

4,229,792

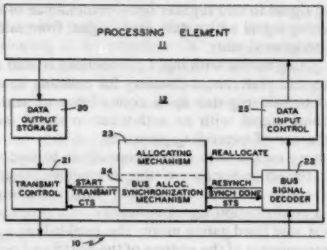
BUS ALLOCATION SYNCHRONIZATION SYSTEM

Earl D. Jensen, Bloomington, and George D. Marshall, North St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 9, 1979, Ser. No. 28,147

Int. Cl.[3] **G06F** *15/16, 11/00*

U.S. Cl. 364—200 **5 Claims**



1. A decentralized bus allocation synchronization system for a plurality of inter-communicating processing devices which share a common data bus in a time multiplexed fashion wherein no single entity controls access to the bus or synchronization of access to the bus comprising:

a plurality of processing devices adapted to communicate along a common bus;

a bus interface unit associated with each of said processing devices for controlling the access of that device to said bus, each said bus interface unit further comprising

transmitting means for transmitting signals over said bus;

receiving means for receiving signals from said bus;

enabling means for enabling access to said bus, said enabling means further comprising:

allocation vector means for storing a predetermined control schedule sequence of instructions related to the use of the bus;

recyclable indexing interface means for indexably addressing said sequence of instructions wherein said indexing is responsive to a command received from said bus;

synchronization checking means for utilizing allocation and synchronization information from previously received communications and the current communication received by said receiving means, and from said indexing interface means to determine the synchronization state of said enabling means;

disabling means for disabling said transmitting means if said synchronization checking means fails to determine synchronization state;

synchronization re-establishing means for re-enabling said transmitter by re-establishing synchronization of said indexing interface means.

4,229,793

METHOD AND APPARATUS FOR CONTROLLING INTERNAL COMBUSTION ENGINES

Hiroshi Yoshida, Aichi; Nobuo Tabara, Chiryu, and Keiji Aoki, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 16, 1978, Ser. No. 906,666

Claims priority, application Japan, May 25, 1977, 52-61446

Int. Cl.[2] **G05B** *15/02;* **G06F** *7/38;* **F02D** *5/00*

U.S. Cl. 364—431 **4 Claims**

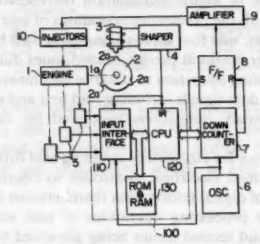
3. Apparatus for controlling a combustion engine having an output shaft rotated by the combustion of fuel comprising:

a pulse generator communicating with said output shaft for generating reference pulses, one of said reference pulses

being generated each time said output shaft of said combustion engine is rotated to a predetermined rotational reference position;

means for detecting operating parameters of said combustion engine, including means for generating a signal related to the rotational speed of said output shaft;

means, responsive to said detecting and pulse generator means for comparing the rotational speed of said output shaft with a predetermined speed value to discriminate whether the rotational speed of said output shaft is high or low, and for calculating a total value related to the required amount of fuel from the output of said detecting means with a preliminarily established calculating program having first and second portions for determining first and second values, respectively, the combination of said first and second values being related to said total



value, both of said portions being executed and said first and second values being determined in response to each of said reference pulses during the period the rotational speed of said output shaft is discriminated as being low, and said first portion and said second portion being executed alternately, and said first and second values being determined alternately, in response to successive ones of said reference pulses during the period the rotational speed of said output shaft is discriminated as being high, said total value being determined after each of said reference pulses from the most recently calculated first and second values;

means for converting said total value corresponding to said required amount of fuel into a time period each time said reference pulse is generated; and

means for supplying fuel to said combustion engine during said time period.

4,229,794

METHOD AND APPARATUS FOR SUPPLYING A LABEL PRINTER WITH PRODUCT INFORMATION

Colin E. Foster, Bensenville, Ill., assignor to Sanitary Scale Company, Belvidere, Ill.

Filed Apr. 26, 1978, Ser. No. 900,328

Int. Cl.[3] **G06K** *15/00, 7/08;* **G01G** *23/44*

U.S. Cl. 364—466 **8 Claims**

7. An automatic weighing, computing and printing scale including in combination:

a product card having product information magnetically stored thereon including product description and product unit price;

a card reader selectively operative into a read mode for reading the product information on said product card and operative into a write mode for recording product information onto said product card;

manually operative product unit price switches;

an encoding switch;

a scale weighing mechanism for weighing product to develop a total product weight;

a computer including a storage means and a calculating means wherein, upon actuation, said computer

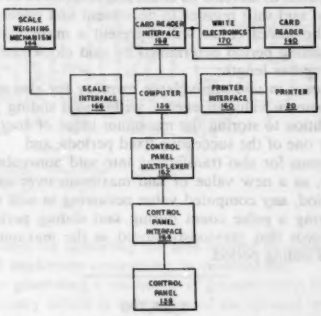
(a) operates said card reader for reading the coded information on the product card and thereafter operates said scale weighing mechanism to provide a total product weight, and

(b) stores said product description and said product unit price and said total product weight information, and

(c) calculates a total product price, and

(d) transmits said product description and said total product price information to a label printer, and

(e) responsive to the operation of said product unit price switches stores the product unit price information therein in the storage means and responsive to the oper-



ation of said encoding switch operates said card reader into said write mode for recording the product unit price information on said product card; and

a label printer for receiving from said computer said product description and said total product price for printing thereof on a label, said label printer being adapted to print said product description and said total product price information on a label in alpha-numeric form and in machine readable form conforming to the format of the uniform product code.

4,229,795

ELECTRONIC MAXIMUM MEASURING DEVICE

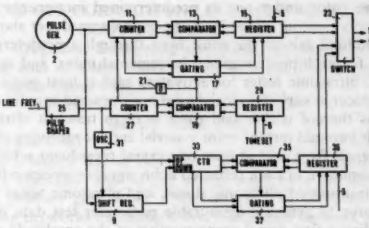
Gunther Vieweg, Nuremberg, and Wilhelm Stürzl, Winkelhaid, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,291

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747406

Int. Cl.[2] **G01R** *11/64*

U.S. Cl. 364—483 **2 Claims**



1. In a device for measuring maximum energy consumption which includes a computing device for computing the energy consumption over a fixed period of time, a non-volatile memory for storing the maximum value of energy within any one of successive fixed periods and means to store as a new value in said memory any computed value which exceeds that previously stored, said computing device being supplied with pulses

representing energy consumption, the improvement comprising:

(a) means in said computing device for simultaneously computing the energy consumption over a sliding measuring period in addition to computing the energy consumption over the predetermined fixed period of time comprising:

(i) means for generating a clock signal;

(ii) a shift register having the pulses representing energy consumption as a data input and the said clock signal as a clock input; and

(iii) means for storing a pulse count, responsive to said pulses to increase its count and responsive to the output of said shift register to decrement said count, whereby the stored count will represent a mean value over a sliding period determined by said clock rate and shift register length;

(b) means in said non-volatile memory for also storing the maximum value of energy within said sliding period, in addition to storing the maximum value of energy within any one of the successive fixed periods; and

(c) means for also transferring into said non-volatile memory, as a new value of said maximum over said sliding period, any computed value occurring in said means for storing a pulse count during said sliding period which exceeds that previously stored as the maximum during said sliding period.

4,229,796

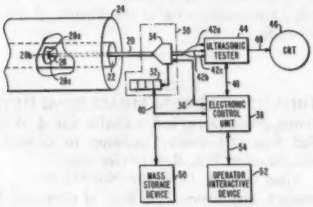
PROGRAMMED CONTROLLER FOR ULTRASONIC TESTING

Steven H. Garrett, Charlotte, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 15, 1979, Ser. No. 12,543

Int. Cl.[3] **G01N** *29/04*

U.S. Cl. 364—507 **9 Claims**



1. In a system for ultrasonically testing the material of a turbine rotor including at least one electronically controlled crystal transducer; a drive unit operative to axially insertably index said at least one crystal transducer within the bore of said turbine rotor under test in predetermined increments while arcuately rotating said at least one crystal transducer about the longitudinal axis of the rotor bore through a predetermined angle for each predetermined incremental index; and an electronic ultrasonic tester for activating said at least one crystal transducer at various indexed axial positions and angular orientations thereof within said rotor bore to transmit ultrasonic signals into said turbine rotor material and for receiving electrical signals from said at least one crysal transducer which are representative of back reflected echo signals corresponding to each transmitted ultrasonic signal, said ultrasonic tester being operative to generate measurable parameter test data signals including a first signal representative of the amplitude of the back reflected echo signal received from the at least one crystal transducer, a second signal which is representative of the depth location within the rotor material concurrently corresponding to an instantaneous amplitude value of said first signal, and at times, an anomaly indication which is representative of said first signal exceeding a preset reference threshold amplitude level, said anomaly indication representing the detection of a potential imperfection in said turbine rotor material, said drive unit being further operative to generate test data signals representative of measurable parameters including said axial position of the at least one crystal transducer within the rotor bore and the angular orientation thereof about the longitudinal axis of the rotor bore related to determining the location of a detected potential imperfection in said turbine rotor bore, the improvement comprising a programmed electronic controller including;

a memory unit for storing a plurality of programmed sets of instructions and data digital words which characterize the operation of said programmed electronic controller;

a microprocessor means operative to process said plurality of programmed sets of instructions and data digital words stored in said memory unit;

first means for electrically coupling said ultrasonic tester to said programmed electronic controller to coordinate the exchange of digital information therebetween in accordance with the processing operations of said microprocessor means, said first means being governed by said microprocessor means at predetermined times during the ultrasonic testing operation to observe said measurable parameter test data signals including said first and second signals and anomaly indications generated by said ultrasonic tester;

second means for electrically coupling said drive unit to said programmed electronic controller to coordinate the exchange of digital information therebetween in accordance with the processing operations of said microprocessor means, said second means being governed by said microprocessor means at predetermined times during the ultrasonic testing operations to observe said measurble test data signals including said axial position and angular orientations of said at least one crystal transducer generated by said drive unit and to adaptively control the drive unit in accordance with the values of the measured test data signals observed from said drive unit and ultrasonic tester and, at times, said generated anomaly indications; and

an operator interactive device electrically coupled to said programmed electronic controller to coordinate the exchange of digital information therebetween in accordance with the processing operations of said microprocessor means, said operator interactive device being operative to enter instructional and initialization test information to said programmed electronic controller and to record ultrasonic test data resulting from the operation of the programmed electronic controller as governed by the microprocessor means included therein.

4,229,797

METHOD AND SYSTEM FOR WHOLE PICTURE IMAGE PROCESSING

Robert S. Ledley, Silver Spring, Md., assignor to National Biomedical Research Foundation, Washington, D.C.

Filed Sep. 6, 1978, Ser. No. 940,052

Int. Cl.[2] **G06F** *15/20;* **H04N** *7/18*

U.S. Cl. 364—515 **35 Claims**

1. A system for analyzing a whole picture relative to a set of predetermined image data corresponding to a whole reference picture, comprising:

scanning means for scanning said whole picture to derive analog image signals corresponding thereto;

digitizing means for digitizing said analog image signals to produce digital image data representing said whole picture;

first memory means for storing said digital image data representing said whole picture;

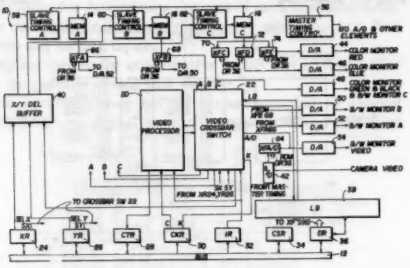
second memory means for storing said set of predetermined image data corresponding to said whole reference picture;

first output means for reading out said digital image data representing said whole picture to provide a first output;

second output means for reading out said set of predeter-

mined image data corresponding to said whole reference picture to provide a second output; and

processing means for whole picture processing said first output and said second output, whereby to analyze said whole picture relative to said set of predetermined image data corresponding to said whole reference picture;



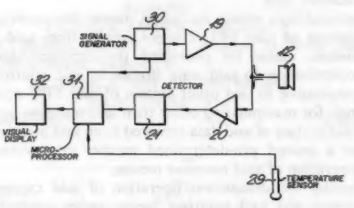
said system further comprising video crossbar switch means for routing said digital image data from said digitizing means to said first memory means, and for routing said first output and said second output to said processing means.

4,229,798

LIQUID STORAGE TANK CONTENTS GAUGE

Aeneas M. Rosie, and Colin J. Macleod, both of Helensburgh, Scotland, assignors to Alistair Francis McDermott, London, England

Filed Jan. 30, 1978, Ser. No. 873,654
Int. Cl.[2] G01F *17/00, 23/00*
U.S. Cl. 364—564 **9 Claims**



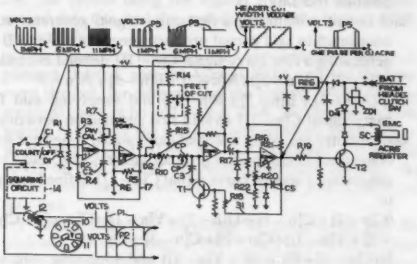
1. A liquid storage tank contents gauge comprising ultrasonic signal means for providing an electrical signal corresponding to the vertical height of the liquid in a tank, electronic means coupled to said signal means for deriving the volume of liquid corresponding to said vertical height, and an output means coupled to said electronic means for providing a usable output of said volume, said ultrasonic signal means including one and only one transducer for both emitting a signal and receiving the same signal when reflected by a liquid-air interface in a tank, said electronic means comprising a plurality of programmable read-only memory units, each containing the value of a liquid volume corresponding to a given vertical height in said tank and means for searching for and finding the read-only memory unit corresponding to the vertical height provided by said signal, and means for passing the output of said read-only memory unit to said output means.

4,229,799

METHOD AND APPARATUS FOR MEASURING AREA TRAVERSED BY VEHICULAR IMPLEMENT

Warren E. Herwig, Wind Lake, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 9, 1979, Ser. No. 27,988
Int. Cl.[3] G01B *7/32*
U.S. Cl. 364—564 **14 Claims**



10. A system for indicating the area farmed by a vehicular agricultural implement comprising, in combination,

means for generating a succession of ground speed pulses at a frequency which is a function of the ground speed of said implement,

a monostable multivibrator for deriving pulses of fixed width at the frequency of said ground speed pulses,

an integrator including a resistance in series with an integrator capacitor receiving said fixed width pulses as an input for counting said pulses and deriving a unidirectional positive slope analog signal whose instantaneous magnitude is indicative of the forward travel of said implement,

means accessible to the implement operator for providing a width reference voltage signal whose magnitude is an inverse function of the width of path of said implement and being selectively adjustable to vary said magnitude,

a comparator for comparing said analog signal to said width reference signal and for providing an output pulse when the former becomes equal to the latter, whereby said output pulse indicates that said implement has farmed an area equal to said distance traveled multiplied by said implement width,

means responsive to the output pulse from said comparator for discharging said integrator capacitor, and

a counter for accumulating the number of output pulses from said comparator as an indication of the area farmed by said implement.

4,229,800

ROUND OFF CORRECTION LOGIC FOR MODIFIED BOOTH'S ALGORITHM

Roubik Gregorian, Sunnyvale, and Kadiri R. Reddy, Santa Clara, both of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

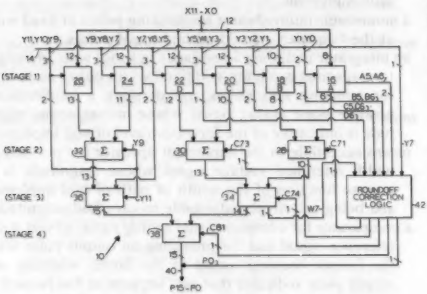
Filed Dec. 6, 1978, Ser. No. 966,870
Int. Cl.[3] G06F *7/52*
U.S. Cl. 364—745 **2 Claims**

1. In a binary digital multiplier implementing a modified Booth's algorithm and having a first stage of a plurality of partial product generators, a second stage of a plurality of summing networks including a first summation network and a second summation network, a third stage including a third summation network, and a fourth stage including a fourth summation network, said multiplier for generating a final product of a series of binary digits, the improvement comprising round off logic circuitry in said multiplier for rounding off to a predetermined nth bit least significant binary digit of said final product without generating the least significant binary digits to the right of said nth bit of said final product

said circuitry including in said first stage a plurality of partial product generators for generating partial products from a multiplicand X and multiplier Y including a first least significant bits multiplier generator A, a second next least significant bits multiplier generator B, a third next least significant bits multiplier C and a fourth next least significant bits multiplier generator D (where the numerical subscript following a letter indicates significance of bit position therein);

said circuitry including a first carry signal generator stage connected to said partial product generators A and B for generating a first carry signal C[n−1]1 defined as equal to (B[n−2]+A[n−2])·(A[n−2]+B[n−3]+A[n−3-])·(A[n−3]+B[n−3]+B[n−2]) and supplying said first carry signal C[n−1]1 to said first summation network;

said circuitry including a second carry signal generator stage connected to said partial product generators C and D for generating a second carry signal C[n−1]3 defined as equal to (C[n−2]+C[n−3]+D[n−2]+Y[n−1])·(C[n−2]+C[n−3]+Y[n−1])·(C[n−2]+C[n−3]+D[n−2-])·(C[n−3]+D[n−2]+Y[n−1]) and supplying said second carry signal C[n−1]3 to said second summation network;



said circuitry including a third carry signal generator stage connected to said partial product generators for generating a third carry signal C[n−1]4 defined as equal to C[n−2]·D[n−2]·Y[n−1]·C[n−3] where Y[n−1] is a multiplier bit two bit positions to the right of the nth bit position of the multiplier, and supplying said third carry signal C[n−1]4 to said third summation network;

said circuitry including a fourth carry signal generator and least significant bit final rounded product generator stage connected to said partial product generators and to said third summation network for generating a fourth carry signal C[n]1 defined as equal to W[n−1]·(S[n−2]1+S[n−2]2) and a least significant bit rounded product output Pn defined as equal to W[n−1] + (S[n−2]1+S[n−2]2) where W[n−1] is the least significant bit carry signal from the third summation network, S[n−2]1 is defined as equal to A[n−-2]·[B[n−2] + (A[n−3]+B[n−3])]+A[n−-2]·[B[n−2] + (A[n−3]+B[n−3])] and S[n−2]2 is defined as equal to C(n−2)·[D[n−2] + Y[n−1] + C[n−3]]+C[n−2]·[D[n−2] + Y[n−1] + C[n−3]] and supplying said fourth summation network with said fourth carry signal and providing said least significant bit rounded product output Pn at the output of said multiplier.

4,229,801

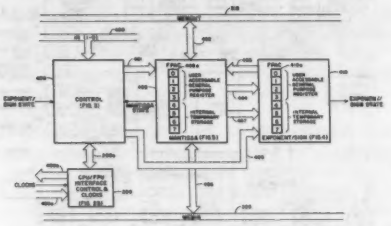
FLOATING POINT PROCESSOR HAVING CONCURRENT EXPONENT/MANTISSA OPERATION

David L. Whipple, Braintree, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Dec. 11, 1978, Ser. No. 968,227

Int. Cl.³ G06F 7/48

U.S. Cl. 364—748 **20 Claims**



1. An FPU for making floating point calculations within a data processing system including processing means for processing said data, memory means for storing said data and for storing instructions which are used in control of operation of said system, input bus for conducting said data and instructions from said processor means to said memory means, output bus for conducting said data and instructions from said memory means to said processor means, said processor means including instruction means arranged to store one of said instructions at a time for controlling and permitting derivation of control of said operation of said system, said FPU comprising:

control means including means for receiving state signals and responsive to both operation of said instruction means and to said state signals, for providing FPU control signals to control operation of said FPU;

mantissa means connected between said input bus and said output bus, including means for conducting certain of said data therebetween, means for receiving certain of said FPU control signals from said control means, means for providing the mantissa means contribution to said state signals to said control means, responsive to said certain of said FPU control signals for manipulating mantissa portions of said certain of said data in a first pre-determined manner; and

exponent/sign means including means for receiving other certain of said FPU control signals from said controls means, means for providing the exponent/sign means contribution to said state signals to said control means, responsive to said other certain of said FPU control signals for manipulating other than said mantissa portions of said certain of said data received from said mantissa means in a second pre-determined manner concurrently with operation of said mantissa means;

whereby the concurrent operation of said exponent/sign means and said mantissa means under control of said control means provides said floating point calculations within said data processing system.

4,229,802

DIGITAL ADDING DEVICE

Ludwig D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,224

Claims priority, application Netherlands, Nov. 10, 1977, 7712367

Int. Cl.² G06F 7/50

U.S. Cl. 364—786 **2 Claims**

1. An improved digital adding device for determining the sum of a plurality of n-bit binary coded numbers, said device comprising:

a digital parallel accumulator, said accumulator comprising:

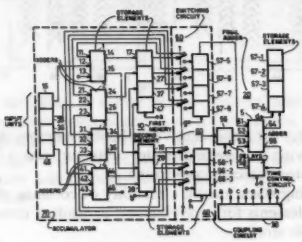
n full adders, each adder corresponding to one of said n-bits, said full adders having inputs to which the bits of the binary coded numbers are transferred and having sum and carry outputs;

a first store having inputs connected to the outputs of said full adders for storing intermediate sums and intermediate carries resulting from the addition and having outputs;

a final adder for determining the sum of each final intermediate sum and final intermediate carry stored in said first store and having inputs;

a coupling circuit for coupling the inputs of said final adder to the outputs of said first store;

a time control circuit having outputs coupled to control inputs of said digital parallel accumulator and said final



adder for controlling said digital parallel accumulator and final adder;

said coupling circuit comprising:

a switching circuit connected to the outputs of said first store and having a first and a second switching state; and

a second store having an output coupled to said final adder inputs and having an input coupled to said switching circuit;

said time control circuit also controlling said coupling circuit so that in the first switching state the outputs of the first store are coupled to inputs of said full adders and in the second switching state the outputs of said first store are coupled to said second store inputs for taking over the final intermediate sum and the final intermediate carry.

4,229,803

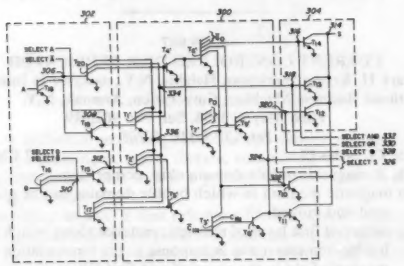
I^2L FULL ADDER AND ALU

Clifford C. Rhodes, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1978, Ser. No. 911,845

Int. Cl.[2] G06F *7/50*

U.S. Cl. 364—787 **4 Claims**



3. A full adder comprising:

input means for receiving first and second data bits and a carry-in bit, and for providing the received first and second data bits and the carry-in bit, and the logical complements thereof;

first logic means for receiving the first and second data bits, and for providing the logical AND and NAND of the received first and second data bits;

second logic means for receiving the complements of the first and second data bits, and for providing the logical OR and NOR of the received first and second data bits;

third logic means for receiving the logical NAND and the logical OR, and for providing the logical AND and the logical NAND of the received logical NAND and logical OR, the results being the logical XOR of the first and second data bits, and the complement of the logical XOR, respectively;

sum logic means for receiving the carry-in bit and the complement thereof, and the logical XOR and the complement thereof, for determining the logical NAND of the received carry-in bit and logical XOR, for determining the logical NAND of the received complements of the carry-in bit and logical XOR, and for providing the logical AND of both logical NANDs determined thereby, the result being the arithmetic sum of the first and second data bits; and

carry output means for receiving the carry-in bit and the logical NAND and logical OR of the first and second data bits, for determining the logical NAND of the received carry-in bit and the received logical OR, and for providing the logical AND of the received logical NAND and the logical NAND determined thereby, the result being the carry-out bit from the arithmetic sum of the first and second data bits and the carry-in bit.

4,229,804

NUMERICAL CONTROL UNIT HAVING A CASSETTE TYPE MEMORY

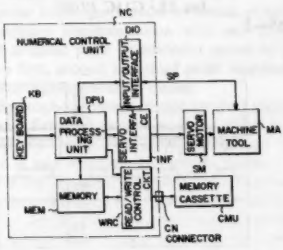
Kengo Kobayashi, Kawasaki, and Ryoji Imazeki, Hachioji, both of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Jun. 20, 1977, Ser. No. 808,398

Claims priority, application Japan, Jun. 28, 1976, 51-76140; Jun. 28, 1976, 51-76141

Int. Cl.[2] G06F *13/00;* **G05B** *19/18*

U.S. Cl. 364—900 **4 Claims**



1. In a numerical control unit for controlling a machine tool, said numerical control unit comprising an internal memory means for storing program data for controlling said machine tool, a data processing means operatively connected to the said memory means for processing the data stored in said internal memory means, input and output means operatively connected to said data processing means for interfacing with said machine tool, and a manual data input means operatively connected to said data processing means for manually entering program data for controlling said machine tool into said numerical control unit, the improvement comprising a removable external semiconductor memory cassette means operatively connected to said data processing means and said internal memory means through a read/write control means, said read/write control means interfacing said external semiconductor memory cassette means with said internal memory means and said data processing means, said data processing means controlling said numerical control unit to transfer stored data from said external semiconductor memory cassette means to said internal

memory means and from said manual data input means and said internal memory means to said external semiconductor memory cassette means, wherein said read/write control means comprises:

a clock circuit/timing generator means for providing timing signals for controlling said read/write control means in response to a strobe signal from said data processing means;

first and second gate circuit means operatively connected to each other and to said clock circuit/timing generator means for transferring a plurality of control signals between said data processing means and said semiconductor memory cassette means;

an address counter, decoder, and a pair of buffer means operatively connected to said second gate circuit means for controlling the addresses of the data stored in said internal memory means and said semiconductor memory cassette means;

a pair of data buffer means operatively connected between a data bus from said data processing means and a pair of data busses from said semiconductor memory cassette means for buffering said data transferred between said data processing means and said semiconductor memory cassette means;

a comparator means, parity generator means, parity checker means, and gating means operatively connected to said semiconductor memory cassette means data busses and said second gate circuit means for insuring the errorless transfer of data between said data processing means and said semiconductor memory cassette means.

4,229,805

MAGNETIC BUBBLE-DOMAIN DEVICE

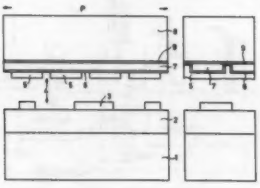
Dirk J. Breed, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,149

Claims priority, application Netherlands, Aug. 24, 1977, 7709312

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—2 **20 Claims**



1. A magnetic domain device comprising:

a plate of magnetic material;

means for generating a magnetic field extending transversely in said plate of magnetic material for sustaining magnetic domains therein;

at least one current conductor under the control of a current therein for simultaneously producing a plurality of preferred positions for said magnetic domain in said plate of magnetic material and, under control of a sequence of currents in said current conductor, producing a continual sequence of preferred positions for domains thereby determining a domain path;

a silicon plate positioned at least substantially parallel to said plate of magnetic material;

an insulating layer at least partly covering the silicon plate;

wherein at least a part of said current conductor is structurally joined to said insulating layer so as to carry off heat which is developed by said current in said conductor through heat transfer to and heat conduction in said silicon plate.

4,229,806

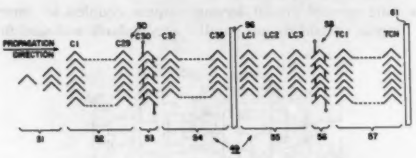
CONSECUTIVE BIT BUBBLE MEMORY DETECTOR

Richard M. Josephs, Willow Grove, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed May 29, 1979, Ser. No. 43,278

Int. Cl.[3] G11C *19/08*

U.S. Cl. 365—8 **10 Claims**



1. A detector for a consecutive bit bubble memory device of the type having a magnetoresistor detector and a dummy magnetoresistor detector comprising:

an expanding stack having a plurality of columns of propagation elements for receiving and expanding consecutive bit bubble stream,

a deep stack adjacent said expanding stack having a plurality of columns of propagation elements for receiving and containing said expanded bubble stream,

a magnetoresistor detector adjacent said deep stack adapted to change resistance as a bubble is propagated there through,

a shallow stack adjacent said detector having a plurality of columns of propagation element,

a first guard rail stack adjacent said shallow stack having a plurality of columns of anti-propagation elements for receiving and annihilating said bubble stream,

a dummy array comprising,

a leading propagation stack having a plurality of propagation columns, the number of said columns in said leading propagation stack being substantially smaller than the number of propagation columns in said deep stack,

a dummy magnetoresistor detector adjacent said leading propagation stack,

a trailing propagation stack adjacent said dummy detector having a plurality of columns of propagation elements, the number of said columns in said trailing propagation stack being substantially equal to the number of columns in said shallow stack, and

a second guard rail stack adjacent said dummy array adapted to prevent stray bubbles from entering said dummy array.

4,229,807

CURRENT CONTROLLED DISK REPLICATOR

Mark H. Kryder, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1978, Ser. No. 902,649

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—12 **17 Claims**

1. A magnetic bubble domain chip, comprising:

a magnetic medium in which bubble domains can be generated and moved,

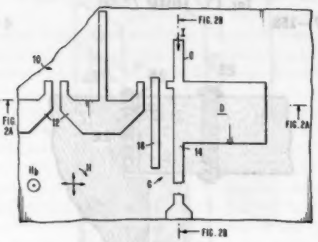
a patterned first layer of magnetic material along which said bubble domains move in response to the reorientation of a magnetic field in the plane of said first layer,

a patterned second layer of non-magnetic electrically conductive material located between said first layer and said magnetic medium,

a replicate generator for splitting magnetic domains from a seed domain, said generator including a disk of magnetic material for holding said seed domain as said magnetic

field reorients, said disk being a portion of said magnetic layer and having a leading edge from which said seed domain stretches as said magnetic field reorients,

a current carrying conductor for carrying electrical current in a path along said leading edge of said disk, said conductor including in a first portion thereof said electrically conductive material and in a second portion thereof said magnetic layer, wherein said electrical current flows through said electrically conductive layer in said first portion and through said magnetic disk in said second portion.

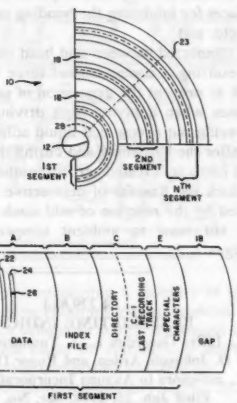


4,229,808

METHOD FOR RECORDING MULTIPLE DATA SEGMENTS ON A STORAGE DISC WITH ECCENTRICITY FACTOR

Peter W. Hui, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 21, 1978, Ser. No. 971,975
Int. Cl.[2] G11C *13/04*; H04N *5/76*
U.S. Cl. 365—234 **5 Claims**



1. A method of recording data on a high-density, optical disc having a plurality of tracks therein, comprising:

recording first data in a first portion of said tracks on said optical disc;

recording at least a first reference file associated with said first data in a second portion of said tracks adjacent to said first portion, said second portion including a last recording track;

recording a character which is repeated in a third portion of said tracks adjacent to said last recording track to thereby signify the end of said first data and the associated first reference file;

leaving a recording gap on said optical disc between said third portion and a fourth portion which will subsequently be used for recording second data; and

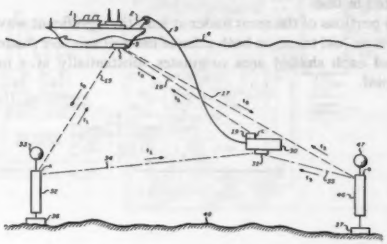
said step of leaving a recording gap comprising determining an eccentricity factor for said optical disc in relation to a means for recording and a means for reading said optical disc and leaving a predetermined approximate number of tracks between said third portion and said fourth portion in conformance with said eccentricity factor.

4,229,809

ACOUSTIC UNDER SEA POSITION MEASUREMENT SYSTEM

Julian H. Schwalbe, Franklin Square, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,001
Int. Cl.[2] G01S *9/68*, *5/18*
U.S. Cl. 367—6 **38 Claims**



1. In a machine method of establishing positional data with respect to a base line disposed at a marine bottom, the steps of:

providing first and second acoustic pulse transponder means one each at the respective ends of said base line,

providing third acoustic pulse transponder means at support means disposed intermediate said marine bottom and a location at the associated marine surface,

providing pulse interrogator-receiver means at said location for cooperative communication with said first, second, and third acoustic pulse transponder means by providing respective first, second and third pulse responses thereto at said interrogator-receiver means,

providing hydrophone means at said support means responsive to said first and second acoustic pulse transponder means for providing respective fourth and fifth pulse responses at said interrogator-receiver means,

utilizing said first, second, and third pulse responses at said location for computing the respective magnitudes of the distance vector R_{SA} from said location to said first acoustic pulse transponder means, of the distance vector R_{SB} from said location to said second acoustic pulse transponder means, and of the distance vector R_{SC} from said location to said third acoustic pulse transponder means,

utilizing said first and fourth pulse responses at said location for computing the magnitude of the distance vector R_{AC} between said first and third acoustic pulse transponder means, and

utilizing said second and fifth pulse responses at said location for computing the magnitude of the distance vector R_{BC} between said second and third pulse transponder means.

4,229,810

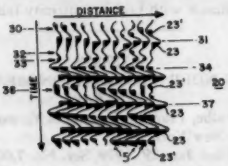
SEISMOGRAM DISPLAY AND METHOD

Jay F. Thompson, 1211 Walnut La., Humble, Tex. 77338

Filed Sep. 28, 1978, Ser. No. 946,902
Int. Cl.[3] G01V *1/34*
U.S. Cl. 367—68 **12 Claims**

1. In a two-dimensional seismogram depicting at least one trace having amplitude variations representing the variations in the value of a property of rock layers beneath the earth's

surface as a function of horizontal and vertical dimensions of the earth; said amplitudes varying in one dimension on both sides of a null axis extending in the other dimensions; said null axis intersecting said trace at null points; the portion of the trace between each pair of consecutive null points forming a



lobe; and a pair of consecutive lobes forming a wavelet, characterized in that

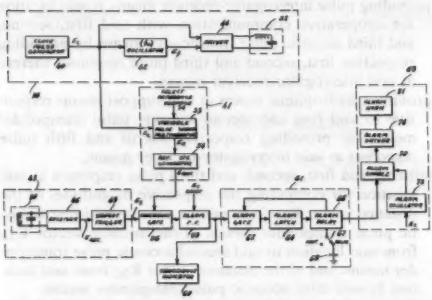
only portions of the areas under at least the significant wavelets on said trace, on both sides of the null axis, are shaded, and each shaded area originates substantially at a null point.

4,229,811

INTRUSION DETECTION METHOD AND APPARATUS

Robert J. Salem, Danbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,105
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—93 **11 Claims**



1. An improved method for detecting the presence of an intruding object or certain other environmental changes in a protected area, the method comprising the steps of:

(a) periodically projecting pulses of acoustical energy from a source means toward a reference surface;

(b) detecting a reflection of said projected pulses of acoustical energy at a receiving means and providing a first indication thereof;

(c) providing an adjustable second indication representative of time elapsed between the projection of a pulse from the source means and the reception at the receiving means of a pulse of acoustical energy reflected from the reference surface;

(d) detecting variations between said first and second indications; and,

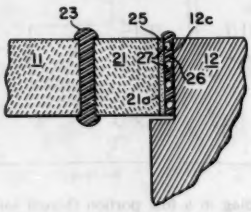
(e) generating an alarm only upon detecting a variation.

4,229,812

APPARATUS FOR SECURING A FERROELECTRIC STACK TO A WEIGHTED PROJECTION SURFACE

Jack W. Holloway, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1971, Ser. No. 201,706
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—158 **4 Claims**



1. In an elestroacoustic transducer including a stack of ferroelectric cylinders held between a head mass and a tail mass, an improvement therefor is provided comprising:

means for coupling said head mass and tail mass to the ferroelectric stack and being bonded onto opposite axial extremes of said ferroelectric stack;

a liquid adhesive coated onto surfaces formed on said head mass and said tail mass each configured to mate with axially exposed surfaces of the coupling means;

a plurality of hollow microspheres disposed in said liquid adhesive maintaining the separation of said axially exposed surfaces from said head mass and said tail mass a distance equal to the diameter of said microspheres thereby providing a thin line rigid joint and further improving impedance matching.

a film of silicone compound disposed on said axially exposed surfaces for inhibiting the bonding of said liquid adhesive thereto; and

means connected between said head mass and said tail mass for exerting a compressional force on said ferroelectric stack to prevent the generation of self-destructive tensile stresses when applying high driving potentials and for squeezing out excess said liquid adhesive while still plastic, after the hardening and curing thereof, adjacent nonrigid joints are created across the silicone compound films to block the transfer of destructive stresses to the stack caused by the reaction of said stack, said head mass and said tail mass to ambient temperature and pressure changes.

4,229,813

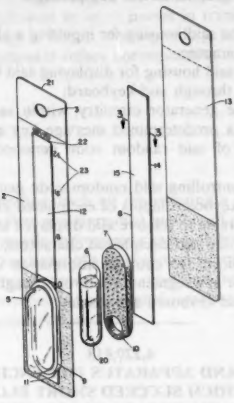
ELAPSED TIME INDICATOR

Robert L. Lilly; Gerardus L. J. Tummers, both of Asheville; Claude D. Johnson, Arden, and Roger D. Davis, Fletcher, all of N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 26, 1978, Ser. No. 919,005
Int. Cl.³ G04F *13/06*
U.S. Cl. 368—89 **17 Claims**

1. A time indicator device comprising: a reservoir, said reservoir containing dimethylpolysiloxane; a porous indicator member, one side of said porous member being impregnated with a dye, said dye being at least slightly dispersible in said dimethylpolysiloxane; said reservoir and said porous member being in a close relationship with one another; said dimethylpolysiloxane adapted to escape from said reservoir upon activation of said reservoir wherein said dimethylpolysiloxane will spread onto said porous member, said dimethylpolysiloxane wetting said porous member thus permitting said dye to flow from said one side of said porous member to the other whereby

the movement of said dimethylpolysiloxane on said porous member provides an indication of the passage of time, said



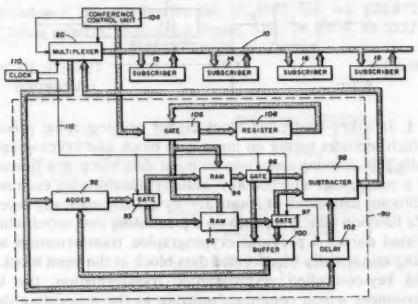
dimethylpolysiloxane being substantially independent of temperature and relative humidity.

4,229,814

MULTIPLEX CONFERENCE BRIDGE

William L Betts, Madeira Beach, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jul. 21, 1978, Ser. No. 926,635
Int. Cl.[3] H04M *3/56*; H04Q *11/04*
U.S. Cl. 370—62 **9 Claims**



8. A method for interconnecting a plurality of subscriber stations on a time division multiplex loop to establish a conference call wherein each subscriber station is assigned a separate time slot within a time frame for transmitting and receiving digitized speech samples, comprising the steps of:

(a) generating a predetermined memory address during each time slot assigned to a subscriber station in the conference call and transferring said memory address to a first and a second memory means,

(b) accumulating a summation sample of the digitized speech samples generated during one time frame by the subscriber stations in the conference call, said step of accumulating utilizing alternately by frame said first and second memory means,

(c) storing said summation sample alternately by frame in one of said memory means at the end of each time frame,

(d) generating a receive digitized speech sample for each subscriber station by subtracting the receiving subscriber station's digitized speech sample which was generated by the receiving subscriber station during the time frame over which said summation sample was accumulated, from said summation sample, and

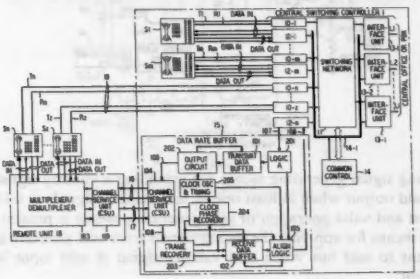
(e) conveying said receive digitized speech sample to the subscriber station that generated the digitized speech sample that was subtracted from said summation sample.

4,229,815

FULL DUPLEX BIT SYNCHRONOUS DATA RATE BUFFER

Peter Cummiskey, Clark, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1978, Ser. No. 962,226
Int. Cl.[3] H04J *3/16*
U.S. Cl. 370—84 **43 Claims**



34. A data rate buffer **(15)** for both receiving a first high frequency data signal for conversion to a transmitted preselected first low frequency signal, and for transmitting a second high frequency signal from a converted received preselected second low frequency signal, said first and second high frequency signals being identical in frequency and said first and second low frequency signal being identical in frequency, said data rate of said high frequency signals being less than data rate of said low frequency signal over a frame period, said converter including a memory **(101, 102)** having a storage capacity at least as great as the amount of high frequency or low frequency data received in said frame period

characterized in that

there is provided a buffer control circuit **(201–205, 105)** for controlling said buffer **(101, 102)** said control circuit **(201–205, 105)** including

a first phase regulating circuit for synchronizing the phase of transmitted said second high frequency signal with received said first high frequency signal, and

an adjusting circuit **(105)** for adjusting the bit length of transmitted said second high frequency signal to be equal to received said first high frequency signal.

4,229,816

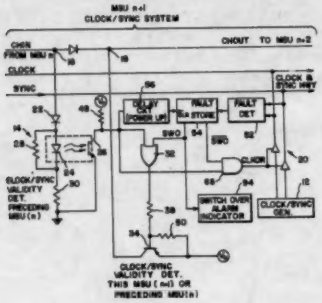
TIMING SIGNAL GENERATION AND DISTRIBUTION SYSTEM FOR TDM TELECOMMUNICATIONS SYSTEMS

Charles J. Breidenstein, Rochester; Jerome S. Caplan, Henrietta, and Bruce G. Littlefield, Honeoye Falls, all of N.Y., assignors to Redcom Laboratories, Inc., Fairport, N.Y.

Filed May 29, 1979, Ser. No. 42,743
Int. Cl.[2] H04J *3/06*
U.S. Cl. 370—100 **20 Claims**

12. In a system having a plurality of units operable in synchronism with each other, a system for the generation and distribution of timing signals which comprises a timing signal bus connected to each of said units for distributing said timing signals thereto, a plurality of timing signal validity signal lines, separate validity signal generation and transmission circuits in each of said units, said circuits having inputs and outputs, said signal validity lines being connected between said inputs and

outputs such that said units are connected in succession via said validity lines, each of said units having means for generating said timing signals, said validity signal generation and transmission circuits comprising means responsive to the presence of a validity signal at said input and the valid operation of said



timing signal generating means for providing a validity signal at said output when at least one of said validity signals at said input and valid operation of said generating means is present, and means for applying the timing signals from said generating means to said bus when said validity signal at said input is absent.

4,229,817

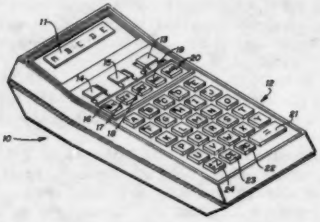
PORTABLE ELECTRONIC CRYPTOGRAPHIC DEVICE

Barrie O. Morgan, Dallas, and Merlon B. Carter, Richardson, both of Tex., assignors to Datotek, Inc., Dallas, Tex.

Filed Apr. 28, 1978, Ser. No. 901,068

Int. Cl.[2] H04L *9/00;* **H04K** *1/02*

U.S. Cl. 375—2 **35 Claims**



1. A cryptographic device comprising:

a housing;

a keyboard on said housing for inputting a plurality of bits of information;

a display on said housing for displaying said list of information input through said keyboard;

circuitry within said housing responsive to said keyboard inputs for controlling said display;

means in said housing for enciphering said bits of information displayed on said display; and

said circuitry operable to remove said displayed keyboard inputs and to display said enciphered bits of information;

wherein said keyboard comprises:

a plurality of keys each representative of a different letter of the alphabet;

shift means for a plurality of normally alphabetic keyboard inputs to provide numeric input capability; and

circuitry responsive to said shift means and controlling said display to display numeric inputs; and

means for shifting said display between alphabetic and numeric state to insure validity of deciphered keyboard inputs.

11. A cryptographic device comprising:

a housing;

a keyboard on said housing for inputting a plurality of enciphered characters;

a display on said housing for displaying said bits of information input through said keyboard;

random code generator circuitry within said housing for receiving a predetermined message key and setting the operation of said random code generator in response thereto;

means for controlling said random code generator to decipher said keyboard inputs of enciphered characters;

circuitry operable to remove said displayed keyboard inputs and to display said deciphered characters; and

means to indicate the entry of information in an improper sequence or in a segment of improper length for inputting through said keyboard and display.

4,229,818

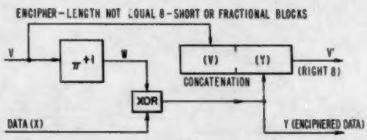
METHOD AND APPARATUS FOR ENCIPHERING BLOCKS WHICH SUCCEED SHORT BLOCKS IN A KEY-CONTROLLED BLOCK-CIPHER CRYPTOGRAPHIC SYSTEM

Stephen M. Matyas; Carl H. W. Meyer, both of Kingston, and Louis B. Tuckerman, III, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,596

Int. Cl.[3] H04L *9/02*

U.S. Cl. 375—2 **10 Claims**



1. In a key-controlled block-cipher cryptographic process which includes taking an input data block and cryptographically transforming same into an input data block as a function of a unique user supplied key, initially transforming each new full input data block of length $L^{(0)}$ by a mathematically invertible function which depends on a preexisting data word which existed during a previous cryptographic transformation and using said initially transformed data block as the input block to said key-controlled cryptographic transformation, the improvement which comprises utilizing as the preexisting data word the immediately preceding cryptographically transformed output data string of length $L^{(0)}$ resulting from immediately preceding cryptographic transformations regardless of the length of the preceding encrypted data block.

4,229,819

DATA TRANSMISSION SYSTEM

Joachim Kuhlmann, and Helmut Moser, both of Heilbronn, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 21, 1978, Ser. No. 898,866

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718226

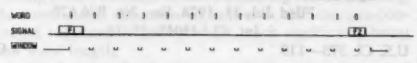
Int. Cl.[3] H03K *7/06*

U.S. Cl. 375—23 **8 Claims**

1. A data transmission system for transmitting and receiving a digital signal corresponding to a digitalized word having a defined number of logic "1" and "0" bits, comprising

a transmitter for modifying said digitalized word to form said digital signal wherein each sequence of n identical bits

of said digitalized word is transmitted as a predetermined number of pulses having a predetermined pulse repetition frequency corresponding to the value of the first bit in said sequence followed by n − 1 pauses in transmission, each pause having a length corresponding to the interval during which said pulses corresponding to said first bit



were transmitted, each bit representing a logic "1" consisting of a first predetermined number of pulses having a first pulse repetition frequency and each bit representing a logic "0" consisting of a second predetermined number of pulses having a second pulse repetition frequency, and

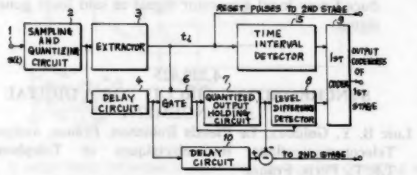
a receiver for receiving said digital signal and converting it to said digitalized word.

4,229,820

MULTISTAGE SELECTIVE DIFFERENTIAL PULSE CODE MODULATION SYSTEM

Hajime Enomoto, Funabashi, Japan, assignor to Kakusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 781,018, Mar. 24, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,372
Claims priority, application Japan, Mar. 26, 1976, 51-33321
Int. Cl.[2] H03K *13/22*
U.S. Cl. 375—27 **6 Claims**



1. A multistage selective differential pulse code modulation system comprising:

a first encoding stage for receiving an input signal for approximating the input signal to a stepwise waveform having n level changes at sampling points selected in the order of level magnitude from a predetermined adjacent N samples in the input signal by developing a first coded output indicative of said stepwise waveform and a remainder corresponding to a difference between said input signal and said stepwise waveform;

a second encoding stage connected to said first stage for receiving said remainder to encode said remainder by delta modulation, which uses a variable step level controlled in accordance with the level variation feature of said remainder so as to provide a second coded output indicative of successive values of said variable step level of said delta modulation; and

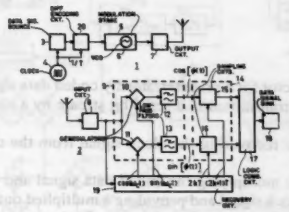
output means connected to said first stage and said second stage to send out said first coded output and said second coded output to indicate said input signal.

4,229,821

SYSTEM FOR DATA TRANSMISSION BY MEANS OF AN ANGLE-MODULATED CARRIER OF CONSTANT AMPLITUDE

Frank de Jager; Cornelis B. Dekker, both of Eindhoven, and Dirk Muilwijk, Hilversum, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,035
Claims priority, application Netherlands, Sep. 9, 1977, 7709917
Int. Cl.[2] H04L *27/18*
U.S. Cl. 375—53 **9 Claims**

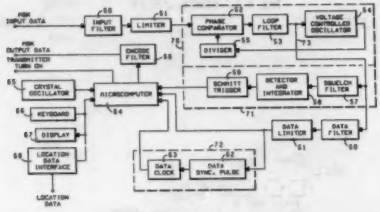


1. A system for transmitting binary data signals with a given symbol rate 1/T from a transmitter to a receiver over a transmission channel of limited bandwidth, this transmitter comprising a data signal source, a clock signal source coupled to said data signal source for synchronizing the data signal source, a modulation stage comprising a carrier oscillator connected to the data signal source for generating an angle-modulated carrier signal of a substantially constant amplitude and a continuous phase, and an output circuit for supplying the angle-modulated carrier signal to the transmission channel, the receiver comprising an input circuit for obtaining the transmitted angle-modulated carrier signal from the transmission channel, a reference carrier circuit coupled to the input circuit for recovering two reference carriers with a phase difference of $\pi/2$ rad., a demodulation circuit, connected to the input circuit and the reference carrier circuit, for coherently demodulating the transmitted angle-modulated carrier signal by these reference carriers and for generating first and second demodulated signals, a reference clock signal circuit coupled to the input circuit for recovering two reference clock signals of half the symbol rate 1/(2T) with a phase difference of π rad., and a regeneration circuit comprising two sampling circuits connected to the demodulation circuit and the reference clock signal circuit for sampling the first and second demodulated signals with these reference clock signals, said receiver further comprising a logic combination circuit for obtaining regenerated binary data signals from the sampled first and second demodulated signals, wherein the modulation stage in the transmitter generates an angle-modulated carrier signal of substantially constant amplitude, whose continuous phase $\phi(t)$ in each symbol interval of length T changes by an amount expressed in rad., from the sequence $-\pi/2$, $-\pi/4$, O, $\pi/4$, $\pi/2$, this amount being determined for the relevant symbol interval by at least two successive data symbols, the value of the phase $\phi(t)$ for instants t within the relevant symbol interval being determined by a filtered version of at least these two successive data symbols.

4,229,822
DATA DETECTOR FOR A DATA COMMUNICATION SYSTEM

Stephen M. Bench, Huntington Beach, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 830531, Sep. 6, 1977, Pat. No. 4,156,867.
This application Jan. 29, 1979, Ser. No. 7,086
Int. Cl.[3] H03D *3/18*; H04[illegible] *27/14*
U.S. Cl. 375—81 11 Claims



1. A detector for a predeterminedly coded data signal predeterminedly transmitted in a serial bit stream by a clock signal, comprising:

means for recovering the clock signal from the coded data signal;

means for multiplying the coded data signal and the recovered clock signal and providing a multiplied output signal;

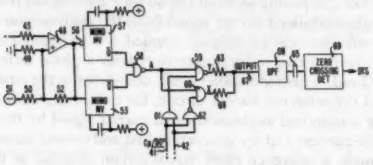
bandpass filter means for passing spectral components of the multiplied output signal between a predetermined lower and upper frequency; and

output means for providing an indication of the presence of the coded data signal when the magnitude of the output of the bandpass filter is less than a predetermined magnitude.

4,229,823
DIGITAL CLOCK PHASE RECOVERY CIRCUITS FOR DATA RECEIVER

David J. Thomson, Murray Hill, and Roland J. Turner, Somerville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1979, Ser. No. 47,021
Int. Cl.[3] H04L *7/00*
U.S. Cl. 375—113 6 Claims



1. In a data transmission system for data signals in which there is in each data bit time at least one signal transition between binary information signal levels in a direction that is indicative of the data information bit state, and circuits are provided for recovering from the data signals bit clock phase information, the method for deriving that bit clock phase information which includes the steps of

generating a pulse of a single predetermined polarity in response to each data signal level transition in either direction between binary signal level states and thereby producing a train of unipolar pulses having a bit-rate frequency component,

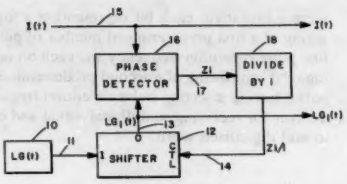
sampling said train periodically approximately midway between information-state-representative transition times, and

reversing the excursion direction in the train of any pulse detected in the sampling step for thereby reinforcing the phase of the bit rate frequency component of the train.

4,229,824
METHOD AND APPARATUS FOR SYNCHRONIZING ELECTRICAL SIGNALS

John En, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Jul. 21, 1978, Ser. No. 926,670
Int. Cl.[3] H04L *25/36*
U.S. Cl. 375—119 8 Claims



1. A method of synchronizing a local generator signal with an input signal wherein said local generator signal consists of a plurality of nondistorted bits having one predetermined period, and wherein said input signal consists of a plurality of bits which nominally are of said one predetermined period but which actually are distorted therefrom, said method including the steps of;

initially generating said local generator signal with a phase that is arbitrary with respect to said input signal;

measuring the phase difference between any two successive bits in said local generator signal and said input signal;

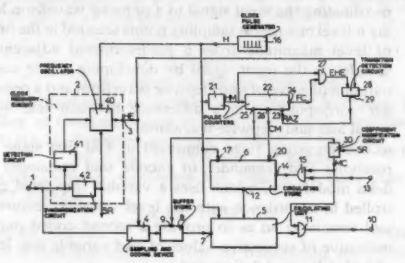
changing the phase of said local generator signal in a direction which decreases said measured difference by an amount proportional to said measured phase difference divided by the total number of phase measurements made to thereby produce a new local generator signal; and

repeating said measuring step and said phase changing step multiple times, each time using the most recently produced new local generator signal as said local generator signal.

4,229,825
SYNCHRONIZING CIRCUIT FOR A DIGITAL ARRANGEMENT

Loic B. Y. Guidoux, Le Plessis Robinson, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Nov. 13, 1978, Ser. No. 960,369
Claims priority, application France, Dec. 28, 1977, 77 39424
Int. Cl.[3] H04L *25/40*
U.S. Cl. 375—118 5 Claims



1. A circuit for synchronizing a digital arrangement with an external clock pulse signal, the digital arrangement having a

calculating unit receiving during each one of its cycles to be synchronized with the external clock pulse signal both an external information to be entered into a buffer store and, thereafter, a sequence of coefficients originating in a predetermined order from a circulating store formed by a number of shift registers equal to the number of coefficients, these shift registers being shifted by pulses derived from a main clock generator, said synchronizing circuit comprising:

switching means included in said circulating store for having the coefficients circulate in series in the cascade-connected registers, word by word, each coefficient being one word length;

means for deriving from said main clock generator a word clock corresponding to the duration of circulation of a coefficient in a register;

means for forming in synchronism with the word clock, operating cycles of constant duration for said calculating unit and a read signal for said buffer store at the beginning of each cycle;

a transition detection circuit to start each cycle arranged for detecting at the occurrence of a word clock pulse the characteristic transition of the external clock pulse signal appearing after the end of each cycle;

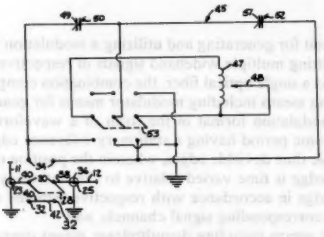
said switching means being controlled so that said coefficients circulate word-by-word from the end of each cycle to the instant at which within the next cycle said buffer store has been read and that thereafter said sequence of coefficients circulates in series until the end of said next cycle.

4,229,826

WIDE BAND IMPEDANCE MATCHING DEVICE

C. L. Wanzer, 111 S. Coleman, Spokane, Wash. 99206

Filed May 30, 1978, Ser. No. 910,149
Int. Cl.³ H04B 1/44
U.S. Cl. 455—83 **10 Claims**



1. A wide band impedance matching device for coupling a radio transceiver to an antenna transmission line, comprising:

a chassis housing;

an input connector mounted to the housing and adapted to be operatively connected to the radio transceiver;

an output connector mounted to the housing and adapted to be operatively connected to the antenna transmission line;

a double pole, double throw manual bypass switch means having a first pair of terminals that are electrically connected to a second pair of terminals when the switch is in a "BYPASS" position and that are electrically connected to a third pair of terminals when the switch is in an "ON" position;

a single coaxial feed cable within the housing coupled to the input connector, the output connector and the manual bypass switch having a center conductor which interconnects one of the connectors with one terminal of the first terminal pair and having another conductor coaxial with said center conductor which interconnects the other connector with the other terminal of the first pair;

an impedance matching network electrically connected between the third pair of terminals for manually adjusting the impedance therebetween to match the impedance of the transceiver with the impedance of the antenna transmission line when the bypass switch means is in the "ON" position; and

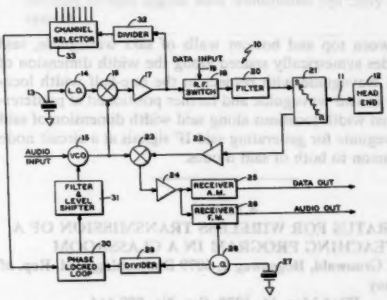
bridging means electrically interconnecting the second pair of terminals so that when the bypass switch means is in the "BYPASS" position the transceiver and antenna transmission line are directly interconnected through the coaxial cable to bypass the impedance matching network and thereby cause a minimum of radio signal attenuation loss.

4,229,827

SINGLE VOLTAGE CONTROLLED OSCILLATOR MODEM

George A. Bowman, Vernon Hills, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 26, 1979, Ser. No. 15,674
Int. Cl.³ H04B 1/54
U.S. Cl. 455—87 **20 Claims**



1. A modem for transmitting data over a transmitting frequency and receiving data over a receiving frequency, wherein said transmitting frequency and said receiving frequency have different values, said modem comprising:

a first oscillator for generating a first signal of a first frequency;

voltage controlled oscillator means having a voltage controlled oscillator for generating a second signal of a second frequency;

first mixer means connected to said first oscillator and to said voltage controlled oscillator for providing a first mixer output signal having a transmitting third frequency as a combination of said first frequency and said second frequency;

input data means responsive to input data for modulating said first mixer output signal and for supplying said modulated first mixer output signal to a transmission medium;

second mixer means connected to said voltage controlled oscillator and said transmission medium for mixing said second signal of said second frequency and said received data having a receiving fourth frequency, wherein said third and fourth frequencies have different values; and,

receiver means connected to said second mixer means for demodulating said received data.

4,229,828

BI-MODE MILLIMETER WAVE MIXER

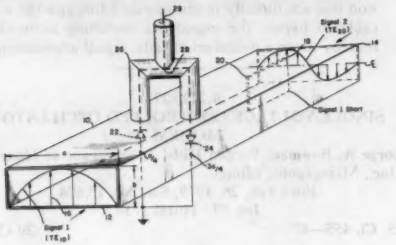
Joseph M. Baird, Newbury Park, and Paul M. Schwartz, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1977, Ser. No. 864,027
Int. Cl.³ H04B 1/26
U.S. Cl. 455—326 **15 Claims**

1. A balanced waveguide mixer structure for generating an intermediate frequency (IF) output signal in response to the mixing of local oscillator and incoming RF input signals, comprising:

(a) means including a rectangular waveguide for propagating RF and local oscillator signals to a chosen location within said waveguide and in preselected modes of waveguide propagation, and

(b) means including a pair of parallel-connected and reverse-poled mixer diodes connected at said chosen location



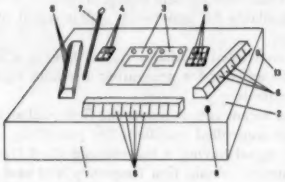
between top and bottom walls of said waveguide, said diodes symetrically spaced along the width dimension of said waveguide with respect to the one-half width location in said waveguide and further positioned at predetermined width locations along said width dimension of said waveguide for generating said IF signals at a circuit node common to both of said diodes.

4,229,829

APPARATUS FOR WIRELESS TRANSMISSION OF A TEACHING PROGRAM IN A CLASSROOM

Peter H. Grunwald, Bogenweg 1, 6079 Buchschlag, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,114
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—600 **7 Claims**



1. Apparatus for the wireless transmission of an instruction program in a classroom, comprising

a transmitting unit comprising a portable prismatic carrying case the size and shape of a suitcase adapted to rest on a table or desk in a flat position with one side of said case forming a top panel, at least one recording unit with operating elements, and an infrared transmitter for transmitting a recorded program from said recording unit housed in said case, said transmitter comprising a plurality of infrared transmitting diodes mounted on said top panel of said case and directed in at least two directions, and operating elements and indicating elements for said infrared transmitter and said recording unit mounted on said top panel,

a plurality of receiving units for individual students in the classroom, each of said receiving units comprising a headset comprising earphones connected by a bow, an infrared receiving diode mounted on said bow, a demodulator for signals received by said receiving diode, an amplifier for the demodulated signal and transducers in said earphones to convert an electrical signal output of said amplifier to a sound signal,

each of said receiving unit including an accumulator providing power for electronic circuitry of said receiving unit, said accumulator and electronic circuitry of said receiving unit being housed in said earphones, and built-in means for charging said accumulator, said charging means comprising an induction coil on the bow of said headset with an upwardly facing magnetic core and means for rectifying current induced in said coil and supplying the rectified current to said accumulator to charge it, and

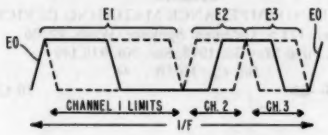
a storage cabinet for said receiving units, said storage cabinet having therein a horizontally extending rail and a plurality of induction coils on said rail with downwardly facing magnetic cores in position to be magnetically coupled with said induction coils of said receiving units when placed in said storage cabinet, said magnetic cores of said headset and said storage cabinet having sufficient magnetic force to suspend said headsets from said induction coils in said storage cabinet by the mutual attraction of said cores, said induction coils of said storage cabinet serving as primary windings to induce current in said induction coils of the receiving units.

4,229,830

APPARATUS AND METHOD FOR PROVIDING A MODULATION FORMAT FOR MULTIPLE WIDEBAND SIGNAL TRANSMISSION

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jun. 1, 1979, Ser. No. 44,730
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—608 **28 Claims**



1. A circuit for generating and utilizing a modulation format for transmitting multiple wideband signals of respective signal channels via a single optical fiber, the combination comprising;

generating means including modulator means for generating said modulation format in the form of a waveform of a given time period having a stationary reference edge and multiple time deviable edges, wherein the position of each latter edge is time varied relative to the stationary reference edge in accordance with respective sampled signals of the corresponding signal channels, and;

receiving means including demultiplexer means operatively coupled to the generating means via said single optical fiber, for detecting the stationary reference edge and for separating the multiple time deviable edges with respect to the stationary reference edge to recover the multiple wideband signals.

4,229,831

DRIFT COMPENSATED FIBER OPTIC-RECEIVER

William A. Lacher, Lansdale, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 22, 1978, Ser. No. 972,502
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—619 **7 Claims**

1. A receiver for use in a fiber-optic system for the transmission of digital data comprising:

photodetector means responsive to the transmitted light incident thereupon for generating electrical pulses corresponding respectively to said digital data,

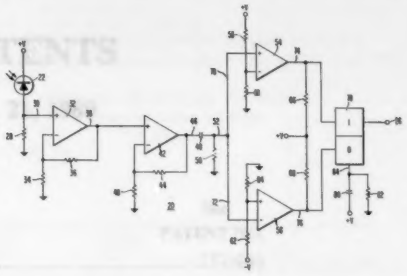
amplifier means coupled to said photodetector means for amplifying said electrical pulses to a predetermined level,

differentiator means coupled to said amplifier means for differentiating the amplified electrical pulses, thereby

providing with respect to a reference potential a pair of signals of opposite polarity for each amplified pulse,

a pair of comparator means coupled to said differentiator means and biased to respective opposite polarities, each of said pair of comparator means providing an output pulse in response to one of said pair of signals of opposite polarity from said differentiator means,

flip-flop means having at least a "1" and a "0" input terminal and a "1" output terminal, means coupling the output pulses of one of said pair of comparator means to said "1" input terminal and the output pulses of the other of said pair of comparator means to said "0" input terminal, the switching of said flip-flop means from one stable state to its opposite state in response to the pulses applied alternately to its "1" and "0" input terminals generating output signal waveforms on said "1" output terminal which are of a predetermined usable amplitude and which correspond



directly to said digital data transmitted optically by said system.

DESIGN PATENTS

GRANTED OCT. 21, 1980

ERRATA

For CLASS	See PATENT NO.
D21-027	257,446

DESIGN PATENTS

GRANTED OCT. 31, 1950

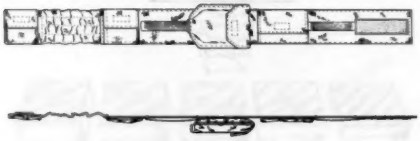
ERRATA

DESIGNS

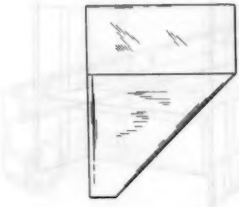
OCTOBER 21, 1980

257,408
COMBINED WRISTBAND AND HANDCOVER
Francis P. Talty, 5240 Reed Dr., Lewisville, Tex. 75056
Filed Nov. 13, 1978, Ser. No. 959,492
Term of patent 14 years
Int. Cl. D02—*06*
U.S. Cl. D2—361

257,409
JOGGER'S BELT
John E. Kishbaugh, and Gordon Storholm, both of P.O. Box 671, Haddonfield, N.J. 08033
Filed Jun. 21, 1978, Ser. No. 917,512
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—383

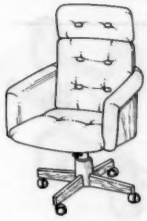


257,410
CARPENTER'S SQUARE POUCH
Fred M. Rink, R.R. #2, Box 337, Wheatfield, Ind. 46392
Filed Jan. 2, 1979, Ser. No. 562
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

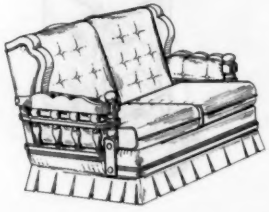


257,411
SMALL OBJECT ORGANIZER FOR LUGGAGE
Renato Castelli, 53, Koning Leopold II laan, B-9000 Gent, Belgium
Filed Sep. 18, 1978, Ser. No. 943,361
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—39

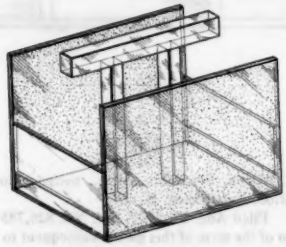
257,412
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Aug. 22, 1977, Ser. No. 826,785
The portion of the term of this patent subsequent to Feb. 5, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



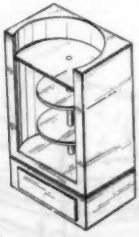
257,413
SEAT
Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Oct. 3, 1977, Ser. No. 838,121
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



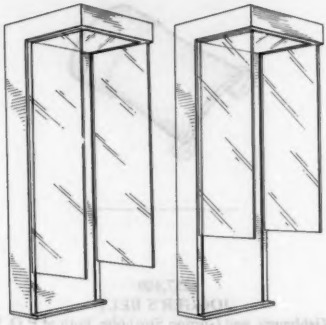
257,414
MAGAZINE RACK
John H. Smith, III, 31 Second Ave., Paterson, N.J. 07524, assignor to John H. Smith, III, Paterson, N.J.
Filed Apr. 7, 1978, Ser. No. 894,408
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



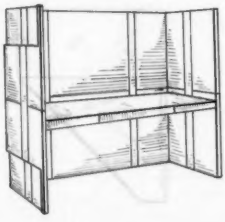
257,415
PICTURE DISPLAY CABINET
Allen Bell, 913 W. Magnolia St., Compton, Calif. 90220
Filed Jul. 17, 1978, Ser. No. 925,411
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



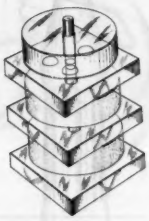
257,416
BOOTH
Donald G. King, Sr., 241 Dickson Park Cres., Mississauga, Ontario, Canada
Filed Jul. 28, 1978, Ser. No. 928,828
Term of patent 14 years
Int. Cl. D6—*06;* D25—*03*
U.S. Cl. D6—27



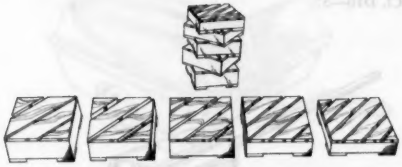
257,417
DESK OR SIMILAR ARTICLE
Lawrence Lerner, New York, N.Y., and Fred Schmitt, Nutley, N.J., assignors to Litton Business Systems, Inc.
Division of Ser. No. 770,328, Feb. 22, 1977. This application Jun. 21, 1979, Ser. No. 50,884
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



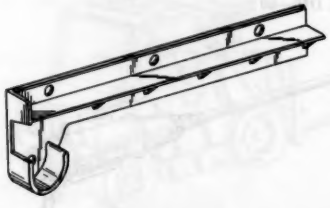
257,418
COMBINED SOAP HOLDER AND SOAP BARS THEREFOR
Sumner Rosenthal, 185 E. 85th St., New York, N.Y. 10028
Filed Jun. 28, 1979, Ser. No. 52,758
Term of patent 14 years
Int. Cl. D21—*01;* D23—*02;* D28—*02*
U.S. Cl. D6—23



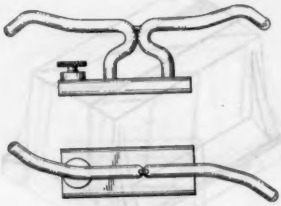
257,419
SET OF STACKABLE COASTERS
Robert E. Russell, P.O. Box 19731, Dallas, Tex. 75219
Filed Dec. 7, 1977, Ser. No. 858,472
Term of patent 7 years
Int. Cl. D07—*06*
U.S. Cl. D7—45



257,420
CLOSET FITTING FOR SUPPORTING A SHELF AND A HANGER ROD
James S. Follows, Surrey, Canada, assignor to Vanguard Plastics Ltd., Surrey, Canada
Filed Jun. 5, 1978, Ser. No. 912,435
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—380

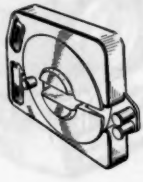


257,421
CLEAT
Richard D. Cox, 22533 Winfield, Novi, Mich. 48050
Filed Oct. 23, 1978, Ser. No. 953,430
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

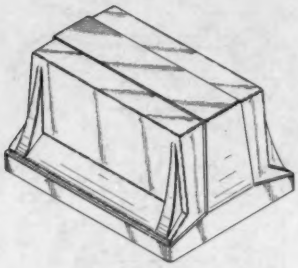


257,422
LINE WINDER
Kurt A. Greber, 3732 Randy Ct., Cincinnati, Ohio 45239
Filed Nov. 13, 1978, Ser. No. 959,717
Term of patent 14 years
Int. Cl. D8—*05, 99*
U.S. Cl. D8—359

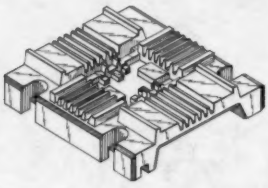
257,423
HOSE CASSETTE
Robert J. Tiedemann, Stamford, Conn., assignor to The Toro Co., Minneapolis, Minn.
Filed Mar. 5, 1979, Ser. No. 17,827
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—359



257,424
COVER FOR FLOOR OUTLET
Thomas J. Sotolongo, Clearwater Beach, Fla., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 26, 1979, Ser. No. 61,084
Term of patent 14 years
Int. Cl. D8—*09*; D13—*03*
U.S. Cl. D8—353

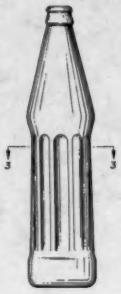


257,425
INTEGRATED CIRCUIT CARRIER
Milton I. Ross, 400 College Ave., Haverford, Pa. 19041
Filed Dec. 8, 1977, Ser. No. 858,675
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187

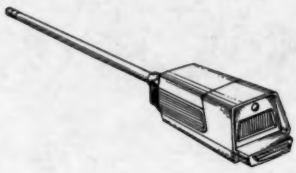


257,426
CARRYING STRAP, OR THE LIKE
Herbert F. D'Alo, Lakewood, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,774
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—292

257,427
BEVERAGE BOTTLE OR THE LIKE
Kenneth R. Cooke, and Alvin H. Schechter, both of New York, N.Y., assignors to GCC Beverages, Inc., Miami, Fla.
Filed Dec. 4, 1978, Ser. No. 966,481
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—126

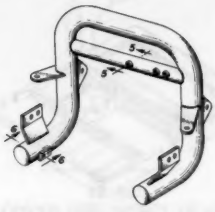


257,428
ELECTRONIC THERMOMETER
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Mar. 23, 1979, Ser. No. 23,333
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

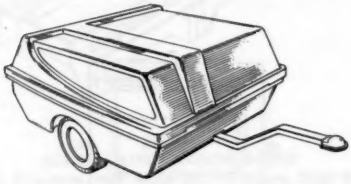


257,429
TEMPERATURE PROBE
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Mar. 23, 1979, Ser. No. 23,332
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60

257,430
COMBINED WINCH MOUNT AND FRONT END GUARD
Victor F. Hickey, Ventura, Calif., assignor to W. R. Grace & Co.
Filed Sep. 18, 1978, Ser. No. 943,409
Term of patent 14 years
Int. Cl. D12—*05, 16*
U.S. Cl. D12—60



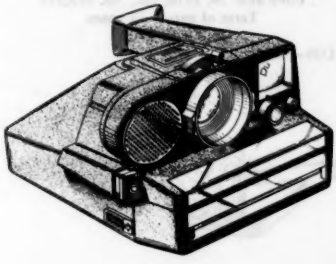
257,431
TRAILER
Arlen L. Huff, 1232 Canterbury Dr., South Bend, Ind. 46628
Filed Nov. 29, 1978, Ser. No. 964,626
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102



257,432
LIFT TRUCK
Bernard E. Erlacher, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Continuation of Ser. No. 823,364, Aug. 10, 1977, abandoned.
This application Jun. 4, 1979, Ser. No. 45,572
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57

257,433
MODULAR CONTROL PANEL FACE
Barnet Weinstein, 14 Robert Rd., Marblehead, Mass. 01945, and John F. Price, 20 Trask Rd., Peabody, Mass. 01960
Division of Ser. No. 897,924, Apr. 19, 1978, Pat. No. Des. 254,370. This application Jun. 22, 1979, Ser. No. 50,992
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35

257,434
PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
James M. Conner, 75 Harrison Ave., Harrison, N.Y. 10528; Donato F. Pizzuti, 271 Lynnfells Pkwy., Saugus, Mass. 01906; John M. Reynard, 8 Birchmeadow Cir., Framingham, Mass., 01701 and James M. Ryan, 327 Central Park West, New York, N.Y. 10025
Filed Apr. 25, 1978, Ser. No. 899,881
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—01

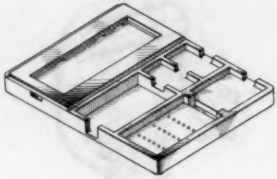


257,435
PAIR OF SPECTACLES
Richard M. Beane, E. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jun. 19, 1978, Ser. No. 916,686
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

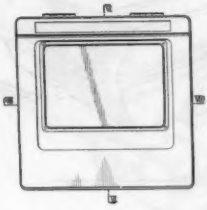
257,436
PAIR OF SPECTACLES
Richard M. Beane, E. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jun. 19, 1978, Ser. No. 916,694
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

257,437
EYEGLASSES
Kurt W. Wittke, 7055 Corbin, Canoga Park, Calif. 91305, and Addie L. Klotz, 18742 Labrador, Northridge, Calif. 91324
Filed Jun. 26, 1978, Ser. No. 919,377
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—72

257,438
HOLDER UNIT FOR A DRAWING TOY
Akio Tsuyuki, Torrance, Calif., assignor to Tomy Corporation, Carson, Calif.
Filed Mar. 27, 1978, Ser. No. 890,826
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59



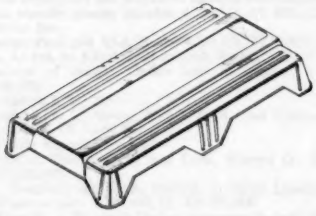
257,439
DUPLICATOR
Koji Horii, Tokyo, Japan, assignor to Horii Toshado Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 1, 1978, Ser. No. 965,286
Claims priority, application Japan, Jun. 16, 1978, 53-24756
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—127



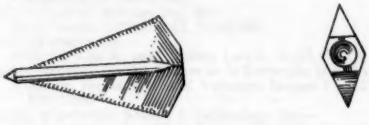
257,440
FOOT EXERCISER
Frank S. Warner, 543 Twenty-Fifth St., Ogden, Utah 84401
Filed Aug. 31, 1978, Ser. No. 938,540
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

257,441
GOLFER'S TOOL
Boris Kralevich, 4868 Beacon Hill Dr., Castro Valley, Calif. 94546
Filed Jan. 8, 1979, Ser. No. 1,970
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

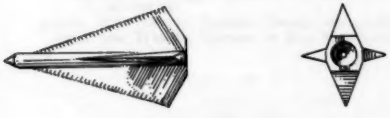
257,442
COVER FOR INSECT TRAPS
Tadanobu Nakai, Nara, Japan, assignor to Tokiwa Chemical Industries, Limited, Osaka, Japan
Filed Jun. 14, 1978, Ser. No. 915,995
Claims priority, application Japan, Jun. 14, 1978, 53-509
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—99



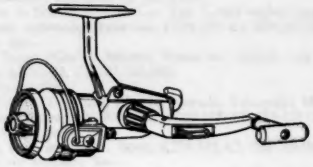
257,443
FOUR-BLADED ARROW POINT
Roger S. Erlandson, 8600 Rubio Dr., Elk Grove, Calif. 95624
Filed Jan. 25, 1979, Ser. No. 6,286
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—12



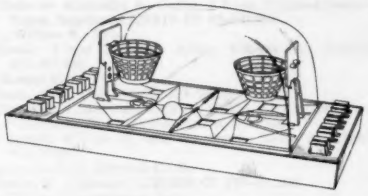
257,444
TWO-BLADED ARROW POINT
Roger S. Erlandson, 8600 Rubio Dr., Elk Grove, Calif. 95624
Filed Jan. 25, 1979, Ser. No. 6,287
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—12



257,445
FISHING REEL
Masakazu Sakamoto, and Tetsuyuki Doi, both of Fukuyama, Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Jul. 10, 1979, Ser. No. 56,389
Claims priority, application Japan, Jan. 16, 1979, 54-1173
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



257,446
BASKETBALL GAME BOARD
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company Ltd., Tokyo, Japan
Filed Aug. 1, 1978, Ser. No. 930,001
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



257,447
APPLICATOR FOR LIQUIDS
Gerry D. Kesler, 1400 NE. 53rd Ct., Ft. Lauderdale, Fla. 33334
Filed Jun. 14, 1978, Ser. No. 915,145
Term of patent 14 years
Int. Cl. D28—*03*; D7—*05*
U.S. Cl. D28—07

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF OCTOBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Cheminova: *See*—
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., 4,229,353, Cl. 260-343.600.

A/S N. Foss Electric: *See*—
Christoffersen, Steen R.; and Bjarno, Ole-Christian, 4,229,180, Cl. 23-230.00R.

A/S Niro Atomizer: *See*—
Felsvang, Karsten S.; and Hansen, Ove E., 4,229,249, Cl. 159-4.00B.

A-T-O Inc.: *See*—
Knox, Raymond L.; and Lindsay, Charles D., 4,229,688, Cl. 320-48.000.

AAI Corporation: *See*—
Kahn, Marvin J.; Malchodi, Robert J.; Paine, Joseph P.; Rogers, Milton J.; and Zouck, Robert L., 4,228,737, Cl. 102-3.000.

Aaron, Jon D.: *See*—
Habdas, Edward P.; and Aaron, Jon D., 4,229,275, Cl. 204-195.00S.

AB Svenska Flaktfabriken: *See*—
Eneroth, Jan-Mats; and Nordfeldt, Sven A., 4,229,183, Cl. 44-1.00D.

AB Volvo: *See*—
Miller, Albert A., 4,228,697, Cl. 74-758.000.

Abbott Laboratories: *See*—
Kerns, Ralph M., 4,228,831, Cl. 141-27.000.

ABC Concrete Products: *See*—
Hyytinen, Niilo M., 4,229,156, Cl. 425-145.000.

Abe, Naoto: *See*—
Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, 4,229,523, Cl. 430-532.000.

Abel, Edward P., to Eastman Kodak Company. Photographic material with temporary barrier layer comprising a mixture of vinylidene chloride terpolymer and polymeric carboxy-ester-lactone and photographic transfer process therefor. 4,229,516, Cl. 430-215.000.

Abel, Heinz: *See*—
Schafer, Paul; and Abel, Heinz, 4,229,176, Cl. 8-582.000.

Abelitis, Andris, to Klockner-Humboldt-Wedag AG. Method for the production of cement clinker low in sulphur. 4,229,226, Cl. 106-100.000.

Aberg, Anders E. B.: *See*—
Olsson, Kjell I.; Aberg, Anders E. B.; and Gislen, Lars O. S., 4,228,677, Cl. 73-64.400.

Acme Visible Records, Inc.: *See*—
Brownlee, Sherwood S.; and Lohr, Warren G., 4,229,060, Cl. 312-305.000.

Adachi, Teruhiko; and Ikeda, Hitoshi, to Teijin Limited. Polyamide multifilament yarn. 4,229,500, Cl. 428-373.000.

Adam, Hans H., to Friedrich Deckel Aktiengesellschaft. Shift means for a multi-shaft sliding gear. 4,228,694, Cl. 74-342.000.

Adams, Frederick J., to Cam Gears Limited. Gear assemblies and transmission. 4,228,699, Cl. 74-853.000.

Adelsberger, Klaus: *See*—
Toussaint, Herbert; Adelsberger, Klaus; and Hoffmann, Herwig, 4,229,346, Cl. 260-239.00B.

Adler, Harold A. Turbine electric generator with solar heating and space cooling. 4,229,660, Cl. 290-2.000.

ADM S.p.A.: *See*—
Ruscitti, Tommaso; Albini, Giovanni; and Torretta, Roberto, 4,228,931, Cl. 222-321.000.

AES Technology Systems, Inc.: *See*—
Savit, Joseph, 4,228,634, Cl. 53-492.000.

AGA Aktiebolag: *See*—
Wiklund, Klas R.; and Ericsson, Lars A., 4,229,102, Cl. 356-5.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Vulmiere, Huguette N.; and Vulmiere, Jacques C., 4,229,097, Cl. 355-35.000.

Agency of Industrial Science & Technology: *See*—
Fukuta, Kenji; Ono-Oka, Ryuzo; Yoshida, Masatoshi; Saito, Kazuhisa; and Kosuda, Hiroyuki, 4,229,397, Cl. 264-113.000.
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,229,381, Cl. 568-454.000.
Tonomura, Kenzo; and Urakami, Teizi, 4,229,543, Cl. 435-245.000.
Yagi, Akihiro; Kuchinomachi, Yasuo; and Kodama, Hiroyuki, 4,228,807, Cl. 128-732.000.

AGFA-Gevaert, A.G.: *See*—
Dunkel, Franz-Heinz; Klinkhammer, Ralf L.; Nebel, Heinz; Spanner, Siegfried; and Seibel, Gerd, 4,228,579, Cl. 29-430.000.
Frank, Karl; and Block, Hans-Dieter, 4,229,521, Cl. 430-372.000.
Ohlschlager, Hans, 4,229,526, Cl. 430-583.000.

Ago, Tokinori: *See*—
Taguchi, Thoru; Ago, Tokinori; and Hashimoto, Isao, 4,229,597, Cl. 568-768.000.

Aigami, Koji; Inamoto, Yoshiaki; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Takaishi, Naotake, to Kao Soap Company, Limited. 1-Aminomethyltricyclo[4.3.1.1^{2,5}]undecane and acid-addition salts thereof. 4,229,375, Cl. 260-563.00P.

Airtek, Inc.: *See*—
Errett, Paul W., 4,229,146, Cl. 417-281.000.

Aisin Seiki Company, Limited: *See*—
Kondo, Toshiyuki; and Ando, Masamoto, 4,229,052, Cl. 303-115.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ando, Masamoto, 4,229,049, Cl. 303-6.00C.

Akama, Masaru, to Shinko Electric Co., Ltd. Linear motor type, non-magnetic metal separating apparatus. 4,229,288, Cl. 209-212.000.

Akao, Takeshi: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,228,932, Cl. 222-368.000.

Akasaki, Katsuyuki: *See*—
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,229,535, Cl. 435-128.000.

Aktiebolaget Bofors: *See*—
Bengtsson, Erik; and Holm, Boris, 4,229,595, Cl. 568-706.000.

Aktiebolaget Care Munters: *See*—
Lindahl, Sven, 4,228,847, Cl. 165-10.000.

Aktiebolaget Carl Munters: *See*—
Lignell, Hakan, 4,229,388, Cl. 261-111.000.

Aktiebolaget Electrolux: *See*—
Malmros, Carl-Henrik B. S., 4,229,135, Cl. 414-284.000.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See*—
Meier, Walter, 4,229,685, Cl. 318-696.000.
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Akzona Incorporated: *See*—
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Albenda, Abraham R. Teaching device. 4,228,597, Cl. 35-9.00B.

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Sacuta, Aleksy, 4,228,854, Cl. 166-248.000.

Albini, Giovanni: *See*—
Ruscitti, Tommaso; Albini, Giovanni; and Torretta, Roberto, 4,228,931, Cl. 222-321.000.

Alcamo, John M.: *See*—
Hocker, Harvey L.; and Alcamo, John M., 4,228,928, Cl. 222-181.000.

Alcan Aluminum Corporation: *See*—
Chalmers, Alexander A.; Gailey, J. Lynn; Englund, James A.; and Popek, Stephen, 4,228,629, Cl. 52-460.000.

Alder, William R.: *See*—
Housh, Lloyd M.; and Alder, William R., 4,229,423, Cl. 423-164.000.

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Bassi, Aldo, 4,229,695, Cl. 324-166.000.
Trevisson, Renato; and Pizzocri, Guido, 4,228,695, Cl. 74-492.000.

Alfred University Research Foundation, Inc.: *See*—
Crandall, William B.; and Wasserstein, Linda J., 4,229,494, Cl. 428-35.000.

Alisyncro S.a.S. di Bruno & C.: *See*—
Bruno, C. Ludovico, 4,228,888, Cl. 198-461.000.

Allis-Chalmers Corporation: *See*—
Caldwell, Robert A., 4,229,643, Cl. 219-146.240.
Herwig, Warren E., 4,229,799, Cl. 364-564.000.

Alper, Joseph B.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,229,359, Cl. 260-397.200.

Alpha Industries, Inc.: *See*—
Borzym, John J., 4,228,706, Cl. 83-320.000.

Alquist, Henry E.; and Ammerman, Allen M., to Phillips Petroleum Company. Process for extracting bitumen from tar sands. 4,229,281, Cl. 208-11.0LE.

Alt, Viktor V.; Mischenkov, Alexandr A.; Ponomarev, Viktor A.; Avdjushev, Eduard L.; Kamynin, Jury S.; Baryshnikov, Vladimir P.; Levin, Grigory K.; and Orlov, Alexei A. Apparatus for measuring parameters of work diagram of piston machines. 4,228,679, Cl. 73-117.300.

Altenpohl, Paul J.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,228,635, Cl. 53-572.000.

Altenpohl, William F.; and Altenpohl, Paul J., to W. F. Altenpohl, Inc. Poultry bagging system. 4,228,635, Cl. 53-572.000.

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LaBarge, Robert L.; and Williams, Marvin H., 4,228,851, Cl. 165-170.000.

AM International, Inc.: *See*—
Ernohazy, Stephen; Meller, Frederick D.; and Oddo, Eugene P., 4,228,921, Cl. 222-40.000.

Amano Pharmaceutical Co. Ltd.: *See*—
Yamada, Hideaki; Shimizu, Sakayu; and Tani, Yoshiki, 4,229,538, Cl. 435-193.000.

Ambac Industries, Incorporated: *See*—
Richmond, James A.; and Parent, Christopher A., 4,229,148, Cl. 417-485.000.

Amchem Products, Inc.: *See*—
Leister, Harry M.; Donovan, Joseph C.; and Hall, Wilbur S., 4,229,492, Cl. 427-345.000.

American Can Company: *See*—
Kellogg, Thomas W., 4,228,918, Cl. 221-65.000.
Kuchenbecker, Morris W., 4,228,946, Cl. 229-33.000.

American Cyanamid Company: *See*—
Asato, Goro, 4,229,383, Cl. 260-968.000.
Conrow, Ransom B.; and Bernstein, Seymour, 4,229,371, Cl. 260-507.00R.
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Larkin, Joseph F., 4,228,895, Cl. 206-339.000.
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,229,370, Cl. 260-506.000.
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,229,372, Cl. 260-507.00R.

American Home Products Corporation: *See*—
Porter, William R., 4,229,447, Cl. 424-244.000.

American Hospital Supply Corporation: *See*—
Smith, Galyn F.; and Zwierszowski, Thomas P., 4,229,420, Cl. 422-310.000.

American Microsystems, Inc.: *See*—
Gregorian, Roubik; and Reddy, Kadiri R., 4,229,800, Cl. 364-745.000.

American Optical Corporation: *See*—
Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., 4,229,228, Cl. 106-287.140.

Amoron, Inc.: *See*—
Foscante, Raymond E.; Gysegem, Albert P.; and Martinich, Pamela J., 4,229,563, Cl. 528-99.000.

Amity Leather Products Company: *See*—
McFarland, Donald, 4,228,836, Cl. 150-40.000.

Ammerman, Allen M.: *See*—
Alquist, Henry E.; and Ammerman, Allen M., 4,229,281, Cl. 208-11.0LE.

Amos, Charles R.: *See*—
Suh, Kyung W.; and Amos, Charles R., 4,229,396, Cl. 264-53.000.

Ampex Corporation: *See*—
Ryan, John O., 4,229,767, Cl. 358-219.000.
Ryan, John O., 4,229,830, Cl. 455-608.000.

Anamorphic Ltd.: *See*—
Ehrenhaft, Franz F., 4,229,648, Cl. 250-205.000.

Anders, Dale F.: *See*—
Sicklesteel, Bruce G.; and Anders, Dale F., 4,229,336, Cl. 260-29.6NR.

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Anderson, Theodore H.; Beuch, Wallace E.; and Lagergren, Richard E. Shared document feed station. 4,229,113, Cl. 400-596.000.

Ando, Masamoto, to Aisin Seiki Kabushiki Kaisha. Hydraulic pressure control system for split brake system. 4,229,049, Cl. 303-6.00C.

Ando, Masamoto: *See*—
Kondo, Toshiyuki; and Ando, Masamoto, 4,229,052, Cl. 303-115.000.

Andoniev, Sergei M.; Laktjushina, Valentina Y.; Medvedovsky, Viliam M.; and Shuster, Kim S. Roll-type electrical precipitator. 4,229,190, Cl. 55-112.000.

Angelucci, Francesco: *See*—
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,229,355, Cl. 260-348.520.

Anic S.p.A.: *See*—
Vigano, Carlo; Quattrone, Francesco; and Toffanetti, Erio, 4,229,645, Cl. 235-92.0QC.

Anichkov, Andrei D.; Polonsky, Jury Z.; and Usov, Vladimir V. Method of guiding a stereotaxic instrument at an intracerebral space target point. 4,228,799, Cl. 128-303.00B.

Antikainen, Veijo; and Reittu, Osmo, to Vaisala Oy. Capacitive capsule for aneroid pressure gauge. 4,229,776, Cl. 361-283.000.

Antos, George J., to UOP Inc. Attenuated superactive multimetallic catalytic composite. 4,229,319, Cl. 252-441.000.

Anumin Pty. Ltd.: *See*—
Parker, Alan J.; and Muir, David M., 4,229,212, Cl. 75-101.00R.

Aoki, Bunya: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.

Aoki, Eiichiro: *See*—
Uchiyama, Yasuji; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,228,712, Cl. 84-1.010.

Aoki, Keiji: *See*—
Yoshida, Hiroshi; Tabara, Nobuo; and Aoki, Keiji, 4,229,793, Cl. 364-431.000.

Aoki, Tadashi, to Jamesbury Corporation. Fire safe butterfly valve. 4,228,816, Cl. 137-72.000.

Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, to Kikkoman Shoyu Co., Ltd. Sealing structure for rotary valves. 4,228,932, Cl. 222-368.000.

Appel, Karl-Richard: *See*—
Brickl, Rolf; Eberhardt, Hans; Appel, Karl-Richard; Lechner, Uwe; and Merk, Walter, 4,229,479, Cl. 424-331.000.

Appley, Robert J. Vehicle control system for the handicapped. 4,228,865, Cl. 180-333.000.

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Arai, Minoru, to Tokyo Print Industry Co., Ltd. Automatic production system for printed-wiring boards. 4,228,582, Cl. 29-650.000.

Arai, Toshio: *See*—
Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, 4,229,085, Cl. 353-75.000.

Arakawa, Hideo; Namekawa, Takashi; Kuniya, Keiichi; and Sugawara, Hiroyuki, to Hitachi, Ltd. Vacuum-type circuit breaker. 4,229,631, Cl. 200-144.00B.

Arcamone, Federico: *See*—
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,229,355, Cl. 260-348.520.

Arima, Tatsuhiro; and Yamanashi, Chusaku, to Nissan Motor Company, Limited; and Fuji Kiko Company, Limited. Seat belt retractor with tension eliminating mechanism. 4,228,971, Cl. 242-107.600.

Arlett, John, to Bryant & May Limited. Cutter for cutting match splints. 4,228,707, Cl. 83-387.000.

Armor-Inox S.A.: *See*—
Dreano, Claude; and Noyelle, Andre, 4,229,458, Cl. 426-264.000.

Armstrong Cork Company: *See*—
Heckles, John S., 4,229,505, Cl. 428-474.400.

Armstrong, W. Ted. Somersault swing. 4,228,999, Cl. 272-33.00R.

Arndt, Friedrich: *See*—
Boroschewski, Gerhard; and Arndt, Friedrich, 4,229,208, Cl. 71-111.000.

Arnold, Fred E.: *See*—
Evers, Robert C.; Arnold, Fred E.; and Helminiak, Thaddeus E., 4,229,566, Cl. 528-185.000.

Arnold, Joe F.; Browning, Robert G.; and Meinzer, Richard A., to United Technologies Corporation. Linear capillary orifice injector. 4,229,158, Cl. 431-178.000.

Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, to Bayer Aktiengesellschaft. Preparation of 1-azolyl-3,3-dimethyl-1-pheroxybutan-2-ones. 4,229,580, Cl. 548-262.000.

Arrowsmith, David R.; and Parsons, David, to Automotive Products Limited. Clutch release bearing assembly. 4,229,058, Cl. 308-184.00A.

Arvanitis, Aristotelis S.; Re, Thomas W.; and Malinowski, Stanley, to Motorola, Inc. Wide-bandwidth monolithic crystal filter. 4,229,718, Cl. 333-192.000.

Arya, Satya P.; Grossman, Leonard N.; and Schoenig, Frederick C., Jr., to General Electric Company. Determining fissile content of nuclear fuel elements. 4,229,654, Cl. 250-358.00R.

Asahi-Dow Limited: *See*—
Kai, Tamotsu; Tsurumi, Michio; Sakakiyama, Takashi; and Horiuchi, Kunihiro, 4,229,507, Cl. 428-541.000.
Nagumo, Tadashi; Yasuike, Akio; and Kataoka, Hiroshi, 4,229,395, Cl. 264-51.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nohmi, Takashi; Yamada, Takao; and Doi, Yoshinao, 4,229,297, Cl. 210-654.000.
Shibuya, Chisei; Itoh, Hirataka; Ishii, Kunihiko; Ishida, Torao; and Shibukawa, Mitsuru, 4,229,573, Cl. 544-21.000.

Asai Germanium Research Institute: *See*—
Miyao, Kohei; Ito, Yoshitaka; and Waeki, Tsuneo, 4,229,468, Cl. 424-287.000.

Asai, Mitsuko: *See*—
Higashide, Eiji; Hatano, Kazunori; and Asai, Mitsuko, 4,229,533, Cl. 435-119.000.
Imada, Akira; Kitano, Kazuaki; and Asai, Mitsuko, 4,229,436, Cl. 424-117.000.

Asai, Yasuhiko: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Kishida, Minolu, 4,229,332, Cl. 260-22.00T.

Asato, Goro, to American Cyanamid Company. Process for the preparation of phosphoramidates. 4,229,383, Cl. 260-968.000.

Ashburner, Adi K., to Harper & Tunstall, Limited. Sheet selecting and dispensing apparatus. 4,228,992, Cl. 270-59.000.

Assmann, Bernd L.: *See*—
Brinkmann, Karl E.; and Assmann, Bernd L., 4,228,874, Cl. 188-72.100.

Ateliers de Constructions Electriques de Charleroi (ACEC): *See*—
Coppin, Roland; and Ghislain, Andre, 4,229,117, Cl. 403-370.000.

Atlantic Richfield Company: *See*—
Baillie, Lloyd A., 4,229,194, Cl. 55-397.000.

Auck, Yoon T., to UOP Inc. Hydrometallurgical recovery of nickel values. 4,229,213, Cl. 75-103.000.

Audi NSU Auto Union AG: *See*—
Naumann, Fritz, 4,228,866, Cl. 180-132.000.

Austin, John J., Jr., to Champion International Corporation. Container with a dispensing orifice and blank therefor. 4,228,899, Cl. 206-626.000.

Autoliv AB: *See*—
Svensson, Gustav E. V., 4,228,969, Cl. 242-107.40A.
Automation Industries, Inc.: *See*—
Sharpe, Donald E., 4,228,688, Cl. 73-631.000.
Automotive Products Limited: *See*—
Arrowsmith, David R.; and Parsons, David, 4,229,058, Cl. 308-184.00A.
Osborne, Duncan W., 4,228,876, Cl. 188-79.5GT.
Avco Everett Research Laboratory, Inc.: *See*—
Mani, Siva A.; Hyman, Howard A.; and Daugherty, Jack D., 4,229,708, Cl. 331-94.50G.
Avdjushev, Eduard L.: *See*—
Alt, Viktor V.; Mischenkov, Alexandr A.; Ponomarev, Viktor A.; Avdjushev, Eduard L.; Kamynin, Jury S.; Baryshnikov, Vladimir P.; Levin, Grigory K.; and Orlov, Alexei A., 4,228,679, Cl. 73-117.300.
Avery, Leslie R., to RCA Corporation. Video games color synthesis. 4,229,760, Cl. 358-22.000.
Avidan, Benjamin, to Techno-Instruments Ltd. Single phase power control circuit. 4,229,690, Cl. 323-24.000.
AVL AG: *See*—
Marsoner, Hermann J., 4,228,808, Cl. 128-762.000.
Azam, Guy: *See*—
Bensussan, Andre; and Azam, Guy, 4,229,657, Cl. 250-493.000.
B. F. Goodrich Company, The: *See*—
Cohen, Louis; and Basu, Pijus K., 4,229,547, Cl. 521-69.000.
Houck, Robert J., 4,229,735, Cl. 340-676.000.
Baab, Albert; and Himmelsbach, Paul, to Jos. Schneider GmbH & Co., Optische Werke Kreuznach. Camera with transversely displaceable objective. 4,229,094, Cl. 354-286.000.
Baatz, Henning; and Rittscher, Dieter, to Steag Kernenergie GmbH. Device for the storage or disposal of radioactive wastes. 4,229,316, Cl. 252-301.10W.
Babad, Harry; and Strachan, Denis M., to United States of America, Energy. Method for immobilizing radioactive iodine. 4,229,317, Cl. 252-301.10W.
Babcock-BSH Aktiengesellschaft vormals Buttner-Schilde-Haas AG: *See*—
Kisters, Theodor; and Vogler, Alfred, 4,229,411, Cl. 422-62.000.
Babington, Robert S. Apparatus for producing finely divided liquid spray. 4,228,795, Cl. 128-200.220.
Backx, Leo J. J.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,229,460, Cl. 424-269.000.
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Badger, Harold J. Measuring tool especially for carpenters. 4,228,592, Cl. 33-174.00G.
Baillie, Lloyd A., to Atlantic Richfield Company. Vapor-solids separating device. 4,229,194, Cl. 55-397.000.
Baird, Joseph M.; and Schwartz, Paul M., to Hughes Aircraft Company. Bi-mode millimeter wave mixer. 4,229,828, Cl. 455-326.000.
Baker Perkins Holdings Limited: *See*—
Steels, Gordon; and Dacey, Raymond G., 4,229,484, Cl. 426-279.000.
Bakonyi, Stephen M., to General Motors Corporation. Low throttled volume engine. 4,228,772, Cl. 123-403.000.
Baldwin, Fredrick M.: *See*—
Noesen, Stanley J.; and Baldwin, Fredrick M., 4,228,583, Cl. 29-747.000.
Ballantyne, James W., to Toole Energy Company, Inc. Hole filling and sealing method and apparatus. 4,229,122, Cl. 405-258.000.
Balzano, Quirino: *See*—
Krone, Kenneth T.; and Balzano, Quirino, 4,229,717, Cl. 333-156.000.
Bando Kiko Co., Ltd: *See*—
Bando, Shigeru, 4,228,617, Cl. 51-3.000.
Bando, Shigeru, to Bando Kiko Co., Ltd. Method for grinding glass plates and the like through numerical control and beveling machine therefor. 4,228,617, Cl. 51-3.000.
Bange, Joseph B., to Western States Machine Company, The. Method and apparatus for determining the thickness of a charge wall formed in a centrifugal basket. 4,229,298, Cl. 210-787.000.
Barber-Colman Company: *See*—
Haug, Edward W., 4,228,781, Cl. 125-11.0CD.
Trost, Wayne C., 4,228,827, Cl. 139-93.000.
Barlow, Gordon A.; Janiszewski, Anthony T.; and Krutsch, John R., to Gordon Barlow Design. Track racing game. 4,229,005, Cl. 273-86.00D.
Barnard, James A., to General Motors Corporation. Method for assembling heat exchangers. 4,228,573, Cl. 29-157.30R.
Barnard, Walter C., to Whirlpool Corporation. Ice maker dispenser structure. 4,228,923, Cl. 222-52.000.
Barnett, Robert D.; Morrill, Charles D.; and Drouin, Andre H., to McEvoy Oilfield Equipment Company. Marine riser tool. 4,228,704, Cl. 81-57.390.
Barre, Rene E. L. Device for tightly stopping a bottle. 4,228,910, Cl. 215-364.000.
Barrett, John H.; and Flynn, Brian P., to Purex Corporation. Permeable dryer cycle fabric softener sheet. 4,229,475, Cl. 428-196.000.
Bartholme, Henri: *See*—
Watzka, Roland; and Bartholme, Henri, 4,228,901, Cl. 209-684.000.
Bartley, Donald L., to Kennametal Inc. Boring bar. 4,229,127, Cl. 408-158.000.
Bartsch, Wolfgang: *See*—
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.
Baryshnikov, Vladimir P.: *See*—
Alt, Viktor V.; Mischenkov, Alexandr A.; Ponomarev, Viktor A.; Avdjushev, Eduard L.; Kamynin, Jury S.; Baryshnikov, Vladimir P.; Levin, Grigory K.; and Orlov, Alexei A., 4,228,679, Cl. 73-117.300.
BASF Aktiengesellschaft: *See*—
Boerzel, Paul; Freyberg, Peter; Greif, Norbert; and Widder, Rudi, 4,229,174, Cl. 8-588.000.
Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, 4,229,590, Cl. 560-174.000.
Junge, Helmut; Kurtz, Walter; Dimroth, Peter; and Scherer, Hans, 4,229,343, Cl. 260-156.000.
Knaflic, France; and Miller, Franz-Friedrich, 4,229,175, Cl. 8-94.170.
Lamm, Gunther, 4,229,345, Cl. 260-205.000.
Mueller-Tamm, Heinz; Jaggard, James F. R.; and Schick, Hans, 4,229,318, Cl. 252-429.00B.
Oeser, Heinz-Guenter; Koenig, Karl-Heinz; and Mangold, Dietrich, 4,229,365, Cl. 260-465.00G.
Sterzel, Hans-Josef; Wurmb, Rolf; Schmidt, Franz; and Seiler, Erhard, 4,229,553, Cl. 525-438.000.
Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, 4,229,551, Cl. 525-337.000.
Theobald, Hans; Wuerzer, Bruno; and Kiehs, Karl, 4,229,205, Cl. 71-92.000.
Toussaint, Herbert; Adelsberger, Klaus; and Hoffmann, Herwig, 4,229,346, Cl. 260-239.00B.
BASF Wyandotte Corporation: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,229,554, Cl. 525-438.000.
Basfer S.R.L.: *See*—
Davini, Giorgio, 4,228,957, Cl. 239-300.000.
Baskevitch, Eugene: *See*—
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Bassi, Aldo, to Alfa Romeo S.p.A. Rotational speed transducer having greater low speed discrimination. 4,229,695, Cl. 324-166.000.
Basu, Pijus K.: *See*—
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Bates, J. Lambert: *See*—
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Battelle Memorial Institute: *See*—
Schneider, Michel; and Lamy, Bernard, 4,229,360, Cl. 260-403.000.
Battles, Donald D., to Cadre Corporation, The. Ladle heating system. 4,229,211, Cl. 75-46.000.
Baumann, Hans-Peter; Karmann, Hans-Georg; and Wiedemann, Achim, to Sandoz Ltd. Disperse dyeing of polyester with benzalketo derivatives as carriers: benzalacetone, methyl cinnamate etc. 4,229,172, Cl. 8-533.000.
Baumgartner, Alfons: *See*—
Burkhardt, Horst; Schwefel, Ernst; Baumgartner, Alfons; Mayer, Anton; and Rauth, Michael, 4,229,646, Cl. 235-92.0GC.
Baus, Heinz-Georg. Lower guide for a sliding partition. 4,228,560, Cl. 16-90.000.
Bava, Kishor: *See*—
Smith, Peter J.; and Bava, Kishor, 4,229,169, Cl. 433-174.000.
Baxter Travenol Laboratories, Inc.: *See*—
Craig, Brian W., 4,229,407, Cl. 264-519.000.
Pearson, Frederick C., 4,229,541, Cl. 435-241.000.
Robinson, Carleton D.; and Debrauwere, Jack J. A., 4,228,835, Cl. 150-8.000.
Bayer Aktiengesellschaft: *See*—
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.
Braun, Dietrich; and Titzschkau, Klaus, 4,229,556, Cl. 525-445.000.
Bruhne, Friedrich; and Lipper, Karl-August, 4,229,379, Cl. 568-437.000.
Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, 4,229,579, Cl. 548-256.000.
Ertel, Werner, 4,229,349, Cl. 260-239.100.
Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,229,444, Cl. 424-200.000.
Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, 4,228,683, Cl. 73-204.000.
Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, 4,228,815, Cl. 137-10.000.
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Paul, Volker, 4,229,459, Cl. 424-269.000.
Mues, Volker; and Behrenz, Wolfgang, 4,229,445, Cl. 424-200.000.
Roth, Hermann J.; Eger, Kurt; Issa, Sedika; and Jacobi, Haireddin, 4,229,453, Cl. 424-251.000.
Sattlegger, Hans; Schmidt, Hermann; and Schnurrbusch, Karl, 4,229,548, Cl. 521-110.000.
Bayer, Dieter: *See*—
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Bayerische Motoren Werke Aktiengesellschaft: *See*—
Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, 4,228,769, Cl. 123-52.00M.

BBC Brown, Boveri & Company, Limited: *See*—
Corti, Christopher W.; Luthi, Rolf; and Vogt, Ernst, 4,228,670, Cl. 72-42.000.
Beardsley, Paul F. Scaffold device for harvesting and maintaining fruit trees. 4,228,870, Cl. 182-127.000.
Beauchamp, Pierre; and Di Giacomo, Augusto. Valance hanger bracket and system. 4,228,980, Cl. 248-262.000.
Beauchamp, William T.: *See*—
Rancourt, James D.; and Beauchamp, William T., 4,229,066, Cl. 350-1.600.
Beery, Jack; and Mihalik, Andrew S., Jr., to Burroughs Corporation. Photosensitive recorder providing linguistic characters. 4,229,086, Cl. 354-5.000.
Behrenz, Wolfgang: *See*—
Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,229,444, Cl. 424-200.000.
Mues, Volker; and Behrenz, Wolfgang, 4,229,445, Cl. 424-200.000.
Beisch, Hans R., to Norris Industries, Inc. Wheel trim retention system. 4,229,047, Cl. 301-37.00P.
Beissel, Dieter: *See*—
Walch, Axel; Wildhardt, Jurgen; and Beissel, Dieter, 4,229,291, Cl. 210-23.00F.
Belcher, Alan E. Method and apparatus for converting pressure into rotative motion. 4,228,658, Cl. 60-649.000.
Bell & Howell Company: *See*—
Koppensteiner, Eugene F., 4,228,972, Cl. 242-201.000.
Bell, Malcolm C. E.: *See*—
Subramanian, Kohur N.; Bell, Malcolm C. E.; Thomas, John A.; and Nissen, Norman C., 4,229,270, Cl. 204-109.000.
Bell, Roy L.; Garner, James B.; and Salmon, Douglas, to Coal Industry (Patents) Limited. Cowl arrangements for mining machines. 4,229,043, Cl. 299-33.000.
Bell Telephone Laboratories, Incorporated: *See*—
Buckley, Reginald R.; and Kohl, Paul A., 4,229,269, Cl. 204-109.000.
Cummiskey, Peter, 4,229,815, Cl. 370-84.000.
Derby, Jeffrey H.; and Rao, Tadikonda N., 4,229,625, Cl. 179-170.00R.
Haben, Dale E.; Kepley, Garry D.; and Vander Molen, Gordon L., 4,229,624, Cl. 179-18.00E.
Henry, Paul S., 4,229,715, Cl. 332-18.000.
Peoples, John T., 4,229,626, Cl. 179-175.30F.
Schaible, Clifford W., 4,229,620, Cl. 179-2.0EB.
Thomson, David J.; and Turner, Roland J., 4,229,823, Cl. 375-113.000.
Bellino, Joseph A.; Feldy, Edmund C.; LaSpesa, Richard E.; and Ramig, Robert J., Jr., to Teletype Corporation. Assembly for processing punched paper tape. 4,229,617, Cl. 178-92.000.
Bellofram Corporation: *See*—
St. Laurent, Wilfred H., Jr., 4,229,010, Cl. 277-30.000.
Beloit Corporation: *See*—
Cronin, Dennis C., 4,229,253, Cl. 162-358.000.
Gill, Michael L., 4,229,254, Cl. 162-358.000.
Bench, Stephen M., to Motorola, Inc. Data detector for a data communication system. 4,229,822, Cl. 375-81.000.
Bendiner, Bernard; and Margolis, Barry I., to Fibre-Chem Corporation. Baled wastepaper product containing a deinking chemical. 4,229,493, Cl. 428-2.000.
Bendix Corporation, The: *See*—
Haase, Elmer A., 4,228,777, Cl. 123-454.000.
Benedix, Harold E., Jr.: *See*—
Rogerson, Jerry B.; Connin, Robert F.; and Benedix, Harold E., Jr., 4,229,387, Cl. 261-66.000.
Benes, Ivan; Muller-Duysing, Wolfgang; and Heinzel, Fritz. Process for the removal of radioactive iodine from a liquid, especially urine, and apparatus to carry out the process. 4,229,300, Cl. 210-96.100.
Bengtsson, Erik; and Holm, Boris, to Aktiebolaget Bofors. Method of producing nitro-phenols. 4,229,595, Cl. 568-706.000.
Bennett, Charles H. Combined razor holder and shaving fluid dispenser. 4,228,587, Cl. 30-41.000.
Bennett, Herbert. Fire retardant coating composition comprising fly ash and polymer emulsion binder. 4,229,329, Cl. 260-17.00R.
Bennett, James D.; Coolidge, Jimmy R.; and Murphy, Clifford E., to CBM Enterprises, Inc. Method and composition for toilet holding tank. 4,229,408, Cl. 422-5.000.
Bensahel, Daniel; Pfister, Jean-Claude; and Revoil, Louis, to Commissariat a l'Energie Atomique. Method of fabrication of semiconductor components having optoelectronic conversion properties. 4,229,237, Cl. 148-190.000.
Benson, Bernard A., to Boeing Construction Equipment Company. System for producing bituminous paving mixtures. 4,229,109, Cl. 366-24.000.
Bensussan, Andre; and Azam, Guy, to CGR-MeV. γ-Ray irradiation head for panoramic irradiation. 4,229,657, Cl. 250-493.000.
Bentley, John; Thompson, Morice W.; and Palluel, Auguste L. L., to Imperial Chemical Industries Limited. Process for the preparation of polymer dispersions. 4,229,339, Cl. 260-34.200.
Bentley, William F.: *See*—
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Berber, Viktor A.; Khodosov, Nikolai A.; Kosygin, Stanislav A.; Mozyakov, Vladimir I.; and Lapshev, Igor M. Centrifugal liquid cleaner. 4,228,948, Cl. 233-3.000.
Berber, Viktor A. Centrifugal liquid purifier. 4,228,951, Cl. 233-31.000.
Berger, Guy F.; and Salom, Jacques, to Commissariat a l'Energie Atomique. Automatic apparatus for weighing and emptying a product contained in a container provided with a cover or lid. 4,228,864, Cl. 177-145.000.
Berger, Peter: *See*—
Orths, Kurt; Prumbaum, Roland; and Berger, Peter, 4,229,412, Cl. 422-80.000.
Bergeron, David L.; and Stephens, Geoffrey B., to International Business Machines Corporation. Voltage compensation of temperature coefficient of resistance in an integrated circuit resistor. 4,229,753, Cl. 357-28.000.
Bergmeyer, Hans U.: *See*—
Ziegenhorn, Joachim; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; and Bergmeyer, Hans U., 4,229,527, Cl. 435-11.000.
Beriger, Ernst, to Ciba-Geigy Corporation. Insecticidal 5-phenylcarbamoyl-barbituric acid. 4,229,454, Cl. 424-254.000.
Berlin, Carter H., to Michaelson, Joseph B. Rabbit restraining box. 4,228,765, Cl. 119-98.000.
Berlin, Donald M., Jr.; Mensing, Clifford E.; and Nilssen, Ole K., to Nilssen, Ole K. Lamp life extender. 4,229,680, Cl. 315-200.00R.
Bernstein, Seymour: *See*—
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Conrow, Ransom B.; and Bernstein, Seymour, 4,229,584, Cl. 560-13.000.
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Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,229,372, Cl. 260-507.00R.
Bethlehem Steel Corporation: *See*—
Brachman, Armand E., 4,229,504, Cl. 428-461.000.
Betts, William L, to E-Systems, Inc. Multiplex conference bridge. 4,229,814, Cl. 370-62.000.
Beuch, Wallace E.: *See*—
Anderson, Theodore H.; Beuch, Wallace E.; and Lagergren, Richard E., 4,229,113, Cl. 400-596.000.
Beyens, Jozef; Dewit, Guillaume; and Lambrechts, Jules, to Konstruktie J. Lambrechts p.v.b.a. Liquid dispensing head and installation. 4,228,927, Cl. 222-148.000.
Bigham, Herbert L.: *See*—
Chamberlin, Rhodes R.; and Bigham, Herbert L., 4,228,570, Cl. 29-33.00R.
Bilson, Edward B.; and Brown, Alfred H., III, to International Telephone and Telegraph Corporation. Luminaire with arcuate reflector. 4,229,779, Cl. 362-217.000.
Binderup, Ernst T., to Leo Pharmaceutical Products, Ltd. A/S. Derivatives of penicillanic acid. 4,229,443, Cl. 424-200.000.
Binney & Smith, Inc.: *See*—
Olinsky, Lester H., 4,229,115, Cl. 401-196.000.
Biondetti, Mario, to Escher Wyss Aktiengesellschaft. Hydraulic support element. 4,228,571, Cl. 29-116.0AD.
Bischoff, Daniel R., to Kysor Industrial Corporation. Double cylinder lock with key retention. 4,228,669, Cl. 70-379.00R.
Bjarno, Ole-Christian: *See*—
Christoffersen, Steen R.; and Bjarno, Ole-Christian, 4,229,180, Cl. 23-230.00R.
Black, Edward D.: *See*—
Comperatore, John A.; Black, Edward D.; and Wise, David J., 4,229,201, Cl. 65-287.000.
Blake, Frederick H.; and Dittmann, Manfred K. Photo electric methods and apparatus for regulating electrical power consumption in stores. 4,229,664, Cl. 307-117.000.
Bliley, Ward L.: *See*—
Wiltshire, Arthur J.; Nara, Harry R.; Le Breton, Edward T.; and Bliley, Ward L., 4,228,575, Cl. 29-407.000.
Block, Hans-Dieter: *See*—
Frank, Karl; and Block, Hans-Dieter, 4,229,521, Cl. 430-372.000.
Blomback, Birger E. G.; and Hessel, Dagny B. Preparation of blood fraction. 4,229,435, Cl. 424-101.000.
Bly, Vincent T.; and Depersia, Anthony T., to United States of America, Army. Hydro-optical modulator for modulating transmission of radiation. 4,229,078, Cl. 350-353.000.
Board of Regents, University of Texas System: *See*—
Finkelstein, Richard A.; and Payne, Shelley M., 4,229,530, Cl. 435-37.000.
Bocchi, Andrea: *See*—
Fecondini, Luciano; and Bocchi, Andrea, 4,229,305, Cl. 210-321.00B.
Boehringer Ingelheim GmbH: *See*—
Brickl, Rolf; Eberhardt, Hans; Appel, Karl-Richard; Lechner, Uwe; and Merk, Walter, 4,229,479, Cl. 424-331.000.
Shelley, Julian H.; Clamp, John R.; and Hartog, Martin, 4,229,477, Cl. 424-330.000.
Boehringer Mannheim GmbH: *See*—
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.
Michal, Gerhard; Laube, Rolf; Roder, Albert; and Schneider, Walter, 4,229,529, Cl. 435-26.000.
Ziegenhorn, Joachim; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; and Bergmeyer, Hans U., 4,229,527, Cl. 435-11.000.
Boeing Company, The: *See*—
Graunke, Donald R., 4,229,264, Cl. 204-1.00T.
Sealey, Francis, 4,228,975, Cl. 244-102.00R.

Boeing Construction Equipment Company: *See*—
Benson, Bernard A., 4,229,109, Cl. 366-24.000.

Boerzel, Paul; Freyberg, Peter; Greif, Norbert; and Widder, Rudi, to BASF Aktiengesellschaft. Dispersant for textile dyeing and optical brightening. 4,229,174, Cl. 8-588.000.

Bogdanovic, Borislav, to Studiengesellschaft Kohle mbH. Method of preparing alkali metal complex compounds. 4,229,354, Cl. 260-347.200.

Bogucki, Bogdan, to Karl Mayer Textilmaschinenfabrik GmbH. Combined damper and thread breakage sensor for textile machines. 4,229,628, Cl. 200-61.180.

Boguslavsky, Ilya Z.: *See*—
Lesokhin, Albert Z.; Daikhovskaya, Evelina A.; and Boguslavsky, Ilya Z., 4,229,671, Cl. 310-198.000.

Bohm, Georg G. A.; and DeTrano, Mario, to Firestone Tire & Rubber Company, The. Self-sealing pneumatic tire. 4,228,839, Cl. 152-347.000.

Bohme, Ekkehard H., to Richardson-Merrell Inc. 7-(2,3-Dihydrobenzo-5-furanyl)-acetamido cephalosporin derivatives. 4,229,575, Cl. 544-27.000.

Bohnsack, Hermann: *See*—
Lahme, Gerhard; Solter, Dieter; and Bohnsack, Hermann, 4,229,104, Cl. 356-246.000.

Boielle, John H.: *See*—
Sharp, Gerald B.; Petrak, Karel L.; Boielle, John H.; Wagner, Hans M.; and Langford, John F., 4,229,519, Cl. 430-287.000.

Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., to Merck & Co., Inc. Substituted naphthyridinones and processes for their preparations. 4,229,456, Cl. 424-256.000.

Boller, Hans. Massager with dumbbell-shaped housing. 4,228,794, Cl. 128-49.000.

Bonfiglio, Andrea: *See*—
Canton, Mario D.; and Bonfiglio, Andrea, 4,228,732, Cl. 99-509.000.

Bongiorno, James W. Audio amplifier. 4,229,706, Cl. 330-272.000.

Booher, Robert K.: *See*—
Heimbigner, Gary L.; and Booher, Robert K., 4,229,667, Cl. 307-297.000.

Borca, Bruno; and Calza, Francesco, to Pirelli Furlanis—Applicazioni Idrauliche Agricole Gomma S.p.A. Liftable and collapsible barrage. 4,229,119, Cl. 405-96.000.

Borg-Warner Corporation: *See*—
Kelbel, Donald W., 4,228,693, Cl. 74-339.000.
Palmer, Albion W., 4,228,883, Cl. 192-111.00A.
Picarello, Joseph F., 4,228,663, Cl. 62-507.000.
Pollock, Richard, 4,229,406, Cl. 264-321.000.
Smirl, Richard L., 4,228,691, Cl. 474-12.000.

Borgiani, Olivio, to Electrolux Corporation. Method of making simulated tufted seat cushion. 4,229,240, Cl. 156-214.000.

Borjesson, Per: *See*—
Lawton, Peter; and Borjesson, Per, 4,228,601, Cl. 36-124.000.

Boroschewski, Gerhard; and Arndt, Friedrich, to Schering AG. Diurethanes with selective herbicidal action. 4,229,208, Cl. 71-111.000.

Borzym, John J., to Alpha Industries, Inc. Swinging ram cut-off machine. 4,228,706, Cl. 83-320.000.

Bouchard, Andre C.; and Fraley, Lawrence R., to GTE Products Corporation. Photoflash lamp and method of making. 4,229,161, Cl. 431-362.000.

Bourner, Malcolm S., to Kent County Council. Pulse order recognition circuit. 4,229,701, Cl. 328-10.00G.

Bowes, Emmerson: *See*—
Peters, Alan W.; Bowes, Emmerson; and Stein, Thomas R., 4,229,282, Cl. 208-111.000.

Bowman, George A., to Honeywell Inc. Single voltage controlled oscillator modem. 4,229,827, Cl. 455-87.000.

Bowman, John H., Jr. Outboard motor locking device. 4,228,983, Cl. 248-553.000.

Boyadjian, Hratch. Method and device for manufacturing a single-piece binder with a hanger for sheet packs. 4,228,830, Cl. 140-102.000.

Boyer, Jean-Jacques, deceased; and by Boyer, Pascal, heir. Hose coupling. 4,229,029, Cl. 285-242.000.

Boyer, Pascal, heir: *See*—
Boyer, Jean-Jacques, deceased; and Boyer, Pascal, heir, 4,229,029, Cl. 285-242.000.

Boyesen, Eyvind, to Performance Industries, Inc. Internal combustion engine fuel supply system. 4,228,770, Cl. 123-73.00V.

Brachman, Armand E., to Bethlehem Steel Corporation. Polyolefin composition having high impact resistance and high temperature flow resistance. 4,229,504, Cl. 428-461.000.

Brady, John H., to Easy Engineering Corporation. Apparatus for processing cellulose insulation. 4,228,964, Cl. 241-186.300.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,229,055, Cl. 308-26.000.

Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Paul, Volker, 4,229,459, Cl. 424-269.000.

Bratt, Martin D.; and Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Dot-etchable photopolymerizable elements. 4,229,517, Cl. 430-271.000.

Bratt, Martin D.; and Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Photo-polymerization and development process which produces dot-etchable material. 4,229,520, Cl. 430-322.000.

Braun, Dietrich; and Titzschkau, Klaus, to Bayer Aktiengesellschaft. Reactive oligomers as curing agent for unsaturated polyester. 4,229,556, Cl. 525-445.000.

Braun, Siegfried V., to Gummi-Roller GmbH & Co. Mono-hose with electrical conductors and end connector means. 4,229,613, Cl. 174-47.000.

Brdr. Schur International A/S J. W. Schursvej: *See*—
Lambach, Heinrich W.; and Sorensen, Leif, 4,228,900, Cl. 206-260.000.

Breed, Dirk J., to U.S. Philips Corporation. Magnetic bubble-domain device. 4,229,805, Cl. 365-2.000.

Breidenstein, Charles J.; Caplan, Jerome S.; and Littlefield, Bruce G., to Redcom Laboratories, Inc. Timing signal generation and distribution system for TDM telecommunications systems. 4,229,816, Cl. 370-100.000.

Brennan, William M.: *See*—
Williams, Ernest E.; and Brennan, William M., 4,229,778, Cl. 361-399.000.

Brenner, Douglas, to Exxon Research & Engineering Co. Aromatic amide plasticizer for ionic polymers. 4,229,337, Cl. 260-32.60A.

Breuers, Theo P. C.; Heijnen, Andreas T.; and van Soest, Hendrikus J. J., to Oce'-van der Grinten N.V. Sorting device. 4,228,995, Cl. 271-292.000.

Breusova, Irina P.: *See*—
Morin, Boris P.; Voinova, Galina J.; Breusova, Irina P.; Stanchenko, Galina I.; and Rogovin, Zakhar A., 4,229,326, Cl. 260-8.000.

Brickl, Rolf; Eberhardt, Hans; Appel, Karl-Richard; Lechner, Uwe; and Merk, Walter, to Boehringer Ingelheim GmbH. Fluoracylresorcinols as ingredients in pharmaceutical, cosmetic and pesticidal compositions. 4,229,479, Cl. 424-331.000.

Bricmont, Francis H.: *See*—
Kotler, Richard G.; and Bricmont, Francis H., 4,229,162, Cl. 432-6.000.

Bridges, Charles R. Apparatus and method for removing dust from tufts of opened cotton fiber. 4,229,286, Cl. 209-22.000.

Brinkmann, Karl E.; and Assmann, Bernd L., to K. Ernst Brinkmann, Industrieverwaltung. Electromagnetic brake. 4,228,874, Cl. 188-72.100.

Brinkmeyer, Francis M.; and Haskell, Donald M., to Phillips Petroleum Company. Dehydrocyclization process. 4,229,602, Cl. 585-407.000.

Brinkmeyer, Francis M.: *See*—
Hutson, Thomas, Jr.; and Brinkmeyer, Francis M., 4,229,609, Cl. 585-660.000.

Brinson, Thomas F., to International Telephone and Telegraph Corporation. Wire wheel cover. 4,229,048, Cl. 301-37.0SS.

Bristol-Myers Company: *See*—
Geria, Navin, 4,229,432, Cl. 424-68.000.

British Nuclear Fuels Limited: *See*—
Chapman, Edward S.; and Smith, William, 4,229,421, Cl. 423-10.000.

Britton, Charles W. Automatic mark reading. 4,228,952, Cl. 235-473.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Watanabe, Kikuo; Kazino, Mitsutaka; and Yamazaki, Hisashi, 4,229,683, Cl. 318-466.000.

Brown, Alfred H., III: *See*—
Bilson, Edward B.; and Brown, Alfred H., III, 4,229,779, Cl. 362-217.000.

Brown, Bruce W.; Copple, Virgil E.; and Wilson, Carroll K., to Jerky Treats, Inc. Glazed liver coated biscuit or kibble for pets. 4,229,485, Cl. 426-305.000.

Brown, Frank R. Vacuum encapsulating apparatus. 4,228,832, Cl. 141-51.000.

Brown, Lee O., to Sea Horse Corporation, The. Concrete removal apparatus. 4,229,121, Cl. 405-158.000.

Browning, Robert G.: *See*—
Arnold, Joe F.; Browning, Robert G.; and Meinzer, Richard A., 4,229,158, Cl. 431-178.000.

Brownlee, Sherwood S.; and Lohr, Warren G., to Acme Visible Records, Inc. Stop mechanism for rotary storage cabinet. 4,229,060, Cl. 312-305.000.

Bruhne, Friedrich; and Lipper, Karl-August, to Bayer Aktiengesellschaft. Process for the preparation of benzaldehyde. 4,229,379, Cl. 568-437.000.

Brulet, Daniel; and Chauvel, Bernard, to Rhone-Poulenc Industries; and Institut Francais du Petrole. Polymer lubricating oil additives bearing nitrogen groups and their use as additives for lubricating oils. 4,229,308, Cl. 252-47.000.

Bruner, Frank D., to Paxton & Vierling Steel Co. Automatically releasing stabilizer. 4,228,741, Cl. 105-197.00D.

Bruno, C. Ludovico, to Alisyncro S.a.S. di Bruno & C. Apparatus for feeding articles such as sweetmeat products to a packaging machine. 4,228,888, Cl. 198-461.000.

Bryant & May Limited: *See*—
Arlett, John, 4,228,707, Cl. 83-387.000.

Bryson, John D., to Will Ross, Inc. Industrial deodorizer. 4,229,415, Cl. 422-109.000.

Bschorr, Oskar, to Messerschmitt-Bolkow-Blohm GmbH. Variable volume resonators using the Belleville spring principle. 4,228,869, Cl. 181-286.000.

Buchel, Karl H.: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Paul, Volker, 4,229,459, Cl. 424-269.000.

Buck, Dan F.: *See*—
Suggs, James L.; and Buck, Dan F., 4,229,480, Cl. 426-24.000.
Suggs, James L.; and Buck, Dan F., 4,229,488, Cl. 426-557.000.

Buckley, Donald J.: *See*—
Thaler, Warren A.; Buckley, Donald J.; and Kennedy Joseph P., 4,229,325, Cl. 260-5.000.
Buckley, Reginald R.; and Kohl, Paul A., to Bell Telephone Laboratories, Incorporated. Spray cell for selective metal deposition or removal. 4,229,269, Cl. 204-109.000.
Budd Company, The: *See*—
Mekosh, George, Jr.; and Hulse, David O., 4,229,051, Cl. 303-99.000.
Bugianesi, Robert L.; Ponpipom, Mitree M.; and Shen, Tsung-Ying, to Merck & Co., Inc. Immunologic adjuvant. 4,229,441, Cl. 424-182.000.
Bujese, David P.; and Rahgo, George P., to Pitney Bowes Inc. Countdown and start mechanism for an electrostatic copier. 4,229,096, Cl. 355-14.0CU.
Burke, John A.; and Gross, James B., to Greene, Tweed & Co., Inc. Spring seal. 4,229,013, Cl. 277-188.00R.
Burkhardt, Horst; Schwefel, Ernst; Baumgartner, Alfons; Mayer, Anton; and Rauth, Michael, to Johannes Heidenhain GmbH. Electronic counter for incremental measuring device. 4,229,646, Cl. 235-92.0GC.
Burkhardt, Horst, to Dr. Johannes Heidenhain GmbH. Improved counter system for incremental measuring instrument. 4,229,647, Cl. 235-92.0GC.
Burkholder, Ward J.; Miller, Glenn E.; and Nagel, Fritz J., to Goodyear Tire & Rubber Company, The. Process for the continuous isolation of dihydric phenols. 4,229,596, Cl. 568-768.000.
Burlington Industries, Inc.: *See*—
Langlois, Marius, 4,228,665, Cl. 66-93.000.
Burr-Brown Research Corporation: *See*—
Graeme, Jerald G., 4,229,692, Cl. 324-62.000.
Burroughs Corporation: *See*—
Beery, Jack; and Mihalik, Andrew S., Jr., 4,229,086, Cl. 354-5.000.
Lacher, William A., 4,229,831, Cl. 455-619.000.
Burton, George W., to Johnson & Jorgensen (Plastics) Limited. Dispenser for small articles having article orientation means. 4,228,920, Cl. 221-265.000.
Bustin, Raphael, to Varian Associates, Inc. Zero reference and offset compensation circuit. 4,229,703, Cl. 328-162.000.
Butler, Donald E., to Warner-Lambert Company. 3-(3-Substituted aryloxy)-2-yridinecarbonitriles, pharmaceutical compositions and methods for their production. 4,229,457, Cl. 424-263.000.
Butler, Irene. Pie crust shaper. 4,228,731, Cl. 99-433.000.
Butler, William E. Bunsen burner guard. 4,229,160, Cl. 431-355.000.
Buyny, Robert A.: *See*—
Jones, Robert J.; Vaughan, Robert W.; Buyny, Robert A.; and O'Rell, Michael K., 4,229,550, Cl. 525-282.000.
Cadre Corporation, The: *See*—
Battles, Donald D., 4,229,211, Cl. 75-46.000.
Cahen, Raymond M., to Labofina S.A. Hydrogenation catalyst and hydrogenation process. 4,229,361, Cl. 260-409.000.
Calaceto, Ralph R. Cyclonic scrubber with perforated plate distributor. 4,229,192, Cl. 55-238.000.
Caldwell, Robert A., to Allis-Chalmers Corporation. Consumable welding electrode. 4,229,643, Cl. 219-146.240.
Calgon Corporation: *See*—
Myers, John G., 4,228,676, Cl. 73-28.000.
Calverley, Maurice: *See*—
Evans, Brian; and Calverley, Maurice, 4,228,824, Cl. 138-119.000.
Calza, Francesco: *See*—
Borca, Bruno; and Calza, Francesco, 4,229,119, Cl. 405-96.000.
Cam Gears Limited: *See*—
Adams, Frederick J., 4,228,699, Cl. 74-853.000.
Cameron Iron Works, Inc.: *See*—
Williams, Bolie C., III, 4,229,012, Cl. 277-127.000.
Cammarota, David F. Stemware shelf bracket. 4,228,905, Cl. 211-71.000.
Camp, Vann T., to United Technologies Corporation. Simulated parameter control for gas turbine engine. 4,228,650, Cl. 60-39.09R.
Campbell, Frank, Jr. Interlocking, laminated refractory for covering a pipe. 4,228,826, Cl. 138-149.000.
Campbell, Robert T., to United States of America, Army. Early-late gate. 4,229,738, Cl. 343-7.300.
Canada, Atomic Energy of, Limited: *See*—
Isaac, Peter, 4,229,255, Cl. 176-31.000.
Canadian Patents and Development Limited: *See*—
Caswell, Bruce F.; and Puddington, Ira E., 4,229,293, Cl. 210-727.000.
Canon Kabushiki Kaisha: *See*—
Date, Nobuaki; Kozuki, Susumu; and Iwashita, Tomonori, 4,229,091, Cl. 354-173.000.
Kawamura, Naoto; Iizuka, Kiyoshi; Tanaka, Nobuyoshi; Kuwayama, Tetsuro; Matsumoto, Kazuya; and Goshima, Takeshi, 4,229,750, Cl. 346-107.00R.
Kurahayashi, Sadasuke; Kato, Yuzo; Watanabe, Asao; Tsuda, Shin; and Muto, Hakaru, 4,229,768, Cl. 358-261.000.
Takahashi, Yuji; and Masaki, Hisaji, 4,229,650, Cl. 250-223.00R.
Tsuji, Takao; Goshima, Takeshi; and Sato, Hideaki, 4,229,763, Cl. 358-128.500.
Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, 4,229,085, Cl. 353-75.000.
Canton, Mario D.; and Bonfiglio, Andrea, to W. Sanderson & Sons S.p.A. Device for the extraction of juices and essential oils from whole fruits, in particular from citrus fruits. 4,228,732, Cl. 99-509.000.
Caplan, Jerome S.: *See*—
Breidenstein, Charles J.; Caplan, Jerome S.; and Littlefield, Bruce G., 4,229,816, Cl. 370-100.000.
Cardarelli, Nathan F., to Environmental Chemicals, Inc. Floating pesticide dispenser. 4,228,614, Cl. 43-131.000.
Carl Freudenberg, Firma: *See*—
Krug, Hans-Dietrich; and Mildenberger, Willi, 4,228,600, Cl. 36-32.00R.
Carl Schleicher & Schull GmbH & Co. KG: *See*—
Hein, Wolfgang; and Cosack, Klaus, 4,229,306, Cl. 210-446.000.
Carlblom, Leland H., to PPG Industries, Inc. Ultraviolet light curable compositions for producing coatings of low gloss. 4,229,274, Cl. 204-159.150.
Carmet Company: *See*—
Scheel, Frank R., 4,228,673, Cl. 72-467.000.
Carniel, Giovanni C.: *See*—
Melloni, Piero; Torre, Arturo D.; Carniel, Giovanni C.; and Rossi, Alessandro, 4,229,449, Cl. 424-248.580.
Carr, Keith E., to Whirlpool Corporation. Ice body delivery apparatus. 4,228,934, Cl. 222-412.000.
Carreau, Bernard A.; and Lombard, Gabriel. Selective optical filter. 4,229,082, Cl. 351-44.000.
Carrier Corporation: *See*—
Sherrod, C. David, 4,228,584, Cl. 29-863.000.
Smorol, Michael E., 4,228,846, Cl. 165-2.000.
Carter, Merlon B.: *See*—
Morgan, Barrie O.; and Carter, Merlon B., 4,229,817, Cl. 375-2.000.
Casabona, Richard J.: *See*—
Levy, John V.; Rodgers, David; Stewart, Robert E.; Potter, David; and Casabona, Richard J., 4,229,791, Cl. 364-200.000.
Case Western Reserve University: *See*—
Holasek, Edward; and Jennings, Wayne D., 4,228,804, Cl. 128-660.000.
Castellani Longo, Massimo, to R.T.M.-Istituto per le Ricerche di Tecnologia Meccanica. Working pieces by laser beam. 4,229,640, Cl. 219-121.0LJ.
Casull, Richard J. Means for mounting cylinder to frame of small hand gun. 4,228,606, Cl. 42-59.000.
Casull, Richard J. Single action revolver with safety locking cylinder. 4,228,607, Cl. 142-66.000.
Casull, Richard J. Cylinder locking mechanism for small revolvers. 4,228,608, Cl. 42-67.000.
Caswell, Bruce F.; and Puddington, Ira E., to Canadian Patents and Development Limited. Dewatering of slimes from phosphate ores. 4,229,293, Cl. 210-727.000.
Caterpillar Tractor Co.: *See*—
Cline, Lawrence R., 4,229,053, Cl. 305-28.000.
Cobb, Delwin E.; and Livesay, Richard E., 4,229,044, Cl. 299-37.000.
Cathers, William P., to PPG Industries, Inc. Sheet orienting and transporting frame. 4,228,993, Cl. 271-236.000.
Caton, Myron A., to Coxwells, Incorporated. Convenience lockbox. 4,228,746, Cl. 109-59.00T.
Cattaneo, Filippo, to Innocenti Santeustacchio S.p.A. Combined support and guide for the mandrel of a restrained mandrel continuous rolling mill. 4,228,939, Cl. 226-172.000.
Causse, Antoine. Apparatus for drilling holes in the ground. 4,228,862, Cl. 175-242.000.
Cavalieri, Michel, to Tractell S.A. Actuator for the release mechanism of a winch receiving a traction rope therethrough. 4,228,989, Cl. 254-384.000.
Cavalleri, Charles G. Coin operated electric timer automatic electric candle. 4,228,885, Cl. 194-9.00T.
Caveney, Jack E.: *See*—
Guzay, Casimer M., Jr.; and Caveney, Jack E., 4,228,709, Cl. 83-620.000.
Cavitt, Stanley B., to Texaco Development Corp. Process for making a silver catalyst. 4,229,321, Cl. 252-476.000.
CBM Enterprises, Inc.: *See*—
Bennett, James D.; Coolidge, Jimmy R.; and Murphy, Clifford E., 4,229,408, Cl. 422-5.000.
Cegedur Societe de Transformation de l'Aluminum Pechiney: *See*—
Izari, Gerard, 4,229,636, Cl. 219-69.00M.
Celanese Corporation: *See*—
Druin, Melvin L.; and Gall, John S., 4,229,340, Cl. 260-40.00R.
Celto, John E.: *See*—
Schimitschek, Erhard J.; Celto, John E.; and Trias, John A., 4,229,711, Cl. 331-94.50P.
CGR-MeV: *See*—
Bensussan, Andre; and Azam, Guy, 4,229,657, Cl. 250-493.000.
Cha, Charles L.: *See*—
Williams, Ted F.; and Cha, Charles L., 4,229,748, Cl. 346-75.000.
Chaban, Castulo, Jr.; and Hawkins, Curtis O., to Du Pont de Nemours, E. I., and Company. Spinneret for the production of hollow filaments. 4,229,154, Cl. 425-72.00S.
Chacornac, Georges, to Manufacture Francaise d'Armes et Cycles de Saint-Etienne Manufrance S.A. Adjustable coupling apparatus for superposed barrels of a sporting gur or the like. 4,228,605, Cl. 42-1.00R.
Chadda, Madan M.; and Maier, Reinhold, to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Method for producing semiconductor bodies having a defined edge profile which has been obtained by etching and is covered with a glass. 4,228,581, Cl. 29-578.000.
Chalmers, Alexander A.; Gailey, J. Lynn; Englund, James A.; and Popek, Stephen, to Alcan Aluminum Corporation. Vertical siding system. 4,228,629, Cl. 52-460.000.
Chamberlin, Rhodes R.; and Bigham, Herbert L., to Photon Power, Inc. Electroding preparation apparatus. 4,228,570, Cl. 29-33.00R.

Champion Corporation: *See*—
Woodruff, Roger D., 4,228,967, Cl. 242-86.50R.
Champion International Corporation: *See*—
Austin, John J., Jr., 4,228,899, Cl. 206-626.000.
Dumond, Vernon, 4,228,904, Cl. 211-55.000.
Moore, Robert L., 4,228,744, Cl. 108-51.300.
Wysocki, Lawrence S., 4,228,945, Cl. 229-30.000.
Chapman, Edward S.; and Smith, William, to British Nuclear Fuels Limited. Purification of plutonium. 4,229,421, Cl. 423-10.000.
Charlton, Gregory G., to International Telephone and Telegraph Corporation. Loop coupler commutating feed for scanning a circular array antenna. 4,229,746, Cl. 343-854.000.
Chauvel, Bernard: *See*—
Brulet, Daniel; and Chauvel, Bernard, 4,229,308, Cl. 252-47.000.
Chemay, Theodore L. Tapemeasure for underwater use. 4,228,589, Cl. 33-138.000.
Chen, Nai Y.; Haag, Werner O.; and Lago, Rudolph M., to Mobil Oil Corporation. Heat balanced cyclic process for manufacture of light olefins. 4,229,608, Cl. 585-640.000.
Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Magnesium-containing dispersions. 4,229,309, Cl. 252-25.000.
Cherian, Gabriel B. Biorhythmic device. 4,228,604, Cl. 40-107.000.
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N. Thermostable nitrogen containing heterocyclic polymers and process for producing. 4,229,560, Cl. 528-4.000.
Cherqui, Jean S.; and Djiane, Alain C. Galenical form of administration of betahistine and its derivatives. 4,229,428, Cl. 424-19.000.
Chiba, Katsuyoshi: *See*—
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.
Chicago Lock Co.: *See*—
Scherbing, Frank J., 4,228,668, Cl. 70-363.000.
Chika, John J. Torsionally resilient structure for a sidecar. 4,229,018, Cl. 280-203.000.
Chikashige, Tadaaki: *See*—
Takahashi, Susumu; and Chikashige, Tadaaki, 4,229,705, Cl. 330-258.000.
Childers, Warren, to Graphic Arts Manufacturing Company. Optical densitometer. 4,229,107, Cl. 356-443.000.
Childers, Warren, to Graphic Arts Manufacturing Company. Optical densitometer. 4,229,108, Cl. 356-443.000.
Childs, William V., to Phillips Petroleum Company. Recovery of methyl hepatfluorobutyrate from methanol by distillation. 4,229,263, Cl. 203-44.000.
Chinea, George L.: *See*—
Stecher, Vera J.; and Chinea, George L., 4,229,414, Cl. 422-101.000.
Chinoin Gyogyszer es Vegyeszeti Termeker Gyara Rt.: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,229,366, Cl. 260-465.00F.
Chiu, Chung W.; and Rutenberg, Morton W., to National Starch and Chemical Corporation. Cold-water dispersible, gelling starch. 4,229,489, Cl. 426-578.000.
Chiu, George T.; Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., to International Business Machines Corporation. Glow discharge etching process for chromium. 4,229,247, Cl. 156-643.000.
Chiung-Feng, Lee. Baby toilet. 4,228,551, Cl. 4-484.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Kanai, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, 4,229,417, Cl. 422-176.000.
Christoffersen, Steen R.; and Bjarno, Ole-Christian, to A/S N. Foss Electric. Process and catalyst for determining nitrogen in a sample according to the Kjeldahl principle. 4,229,180, Cl. 23-230.00R.
Chromie, Edsel. Solar energy concentrator. 4,229,076, Cl. 350-292.000.
Chugai Seiyaku Kabushiki Kaisha: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Churley, George; and Fraula, Louis F., to Hobart Corporation. Warewasher sanitizer vented metering system. 4,229,229, Cl. 134-18.000.
Ciba-Geigy AG: *See*—
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,229,577, Cl. 548-138.000.
Ciba-Geigy Corporation: *See*—
Beriger, Ernst, 4,229,454, Cl. 424-254.000.
Feinauer, Dieter; and Streinz, Ludwig, 4,229,557, Cl. 525-480.000.
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,229,576, Cl. 544-222.000.
Kiefer, Jurg; and Haug, Theobald, 4,229,351, Cl. 260-326.260.
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,229,207, Cl. 71-107.000.
Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, 4,229,344, Cl. 260-157.000.
Schafer, Paul; and Abel, Heinz, 4,229,176, Cl. 8-582.000.
Stecher, Vera J.; and Chinea, George L., 4,229,414, Cl. 422-101.000.
Citizen Watch Co., Ltd.: *See*—
Ebihara, Heihachiro; and Sekiya, Fukuo, 4,229,668, Cl. 307-304.000.
Kato, Yoshiaki, 4,228,646, Cl. 368-66.000.
Nomura, Yasushi, 4,228,645, Cl. 368-75.000.
Watanabe, Minoru; and Tamaru, Munetaka, 4,228,644, Cl. 368-28.000.
City of Charlotte: *See*—
Deaton, Willis R.; Clark, John I., Jr.; and Raynor, Harold M., 4,229,726, Cl. 340-38.00R.
Clamp, John R.: *See*—
Shelley, Julian H.; Clamp, John R.; and Hartog, Martin, 4,229,477, Cl. 424-330.000.
Clark, David E.: *See*—
Degler, Howard E., Jr.; Clark, David E.; Hren, John J.; Jenkins, David A.; and Johnson, Paul F., III, 4,228,800, Cl. 128-303.140.
Clark, George W., III: *See*—
Mitscher, Lester A.; Clark, George W., III; and Hudson, Paul B., 4,229,592, Cl. 560-231.000.
Clark, John I., Jr.: *See*—
Deaton, Willis R.; Clark, John I., Jr.; and Raynor, Harold M., 4,229,726, Cl. 340-38.00R.
Clark, Richard J. Latch for folding and swinging doors. 4,228,842, Cl. 160-234.000.
Clevepak Corporation: *See*—
Molvar, Allen E., 4,229,302, Cl. 210-220.000.
Cline, Lawrence R., to Caterpillar Tractor Co. Track guide assembly. 4,229,053, Cl. 305-28.000.
Coal Industry (Patents) Limited: *See*—
Bell, Roy L.; Garner, James B.; and Salmon, Douglas, 4,229,043, Cl. 299-33.000.
Plummer, Derek, 4,229,042, Cl. 299-18.000.
Tothfalusi, Miklos, 4,228,890, Cl. 198-514.000.
Coan, Michael H., to Cutter Laboratories, Inc. Hydrolase purified from human plasma. 4,229,540, Cl. 435-219.000.
Cobb, Delwin E.; and Livesay, Richard E., to Caterpillar Tractor Co. Clevis-mounted impact ripper. 4,229,044, Cl. 299-37.000.
Cochrane, Peter, to Post Office, The. Multiplexing speech signals. 4,229,622, Cl. 370-81.000.
Coffman, Paul M., to Shell Oil Company. Continuous method for forming thermoplastic slab stock. 4,229,405, Cl. 264-313.000.
Coggin, Charles H., Jr.; and Jones, John L., Jr., to Nitto Boseki Co., Ltd. Apparatus for drawing of glass fiber. 4,229,198, Cl. 65-11.00W.
Cohen, Abraham B.: *See*—
Bratt, Martin D.; and Cohen, Abraham B., 4,229,517, Cl. 430-271.000.
Bratt, Martin D.; and Cohen, Abraham B., 4,229,520, Cl. 430-322.000.
Cohen, David L. Athletic glove. 4,228,548, Cl. 2-161.00A.
Cohen, Louis; and Basu, Pijus K., to B. F. Goodrich Company, The. Method of preparing spherical porous bead-type polymers. 4,229,547, Cl. 521-69.000.
Colby, Thomas H., to Shell Oil Company. Preparation of meta-phenoxytoluene. 4,229,594, Cl. 568-635.000.
Colby, Thomas H.: *See*—
Smutny, Edgar J.; and Colby, Thomas H., 4,229,380, Cl. 568-435.000.
Cole, Donald G.; Hartmann, Achim; Kulling, Achim M.; and Trub, Hermann B., to NL Industries, Inc. Process for pelletizing and neutralizing solid mixtures of metal chlorides. 4,229,399, Cl. 264-117.000.
Cole-Parmer Instrument Company: *See*—
Hogan, Lawrence R., 4,228,930, Cl. 222-212.000.
Colgate-Palmolive Company: *See*—
Pocklington, Terence W., 4,229,401, Cl. 264-248.000.
Slaton, Clifton F., 4,228,678, Cl. 73-64.400.
Collier, James A.: *See*—
Lin, Lawrence Y.; Gutsche, Henry W.; and Collier, James A., 4,228,578, Cl. 29-423.000.
Combustion Engineering, Inc.: *See*—
Smirlock, Martin E.; and Smith, Donald A., 4,228,747, Cl. 110-347.000.
Commissariat a l'Energie Atomique: *See*—
Bensahel, Daniel; Pfister, Jean-Claude; and Revoil, Louis, 4,229,237, Cl. 148-190.000.
Berger, Guy F.; and Salom, Jacques, 4,228,864, Cl. 177-145.000.
Comperatore, John A.; Black, Edward D.; and Wise, David J., to PPG Industries, Inc. Apparatus for bending glass sheets to complicated curvatures using localized supplementary heating. 4,229,201, Cl. 65-287.000.
Concept, Inc.: *See*—
Degler, Howard E., Jr.; Clark, David E.; Hren, John J.; Jenkins, David A.; and Johnson, Paul F., III, 4,228,800, Cl. 128-303.140.
Conners, Richard G.: *See*—
Merrill, Richard C.; and Conners, Richard G., 4,229,777, Cl. 361-314.000.
Connin, Robert F.: *See*—
Rogerson, Jerry B.; Connin, Robert F.; and Benedix, Harold E., Jr., 4,229,387, Cl. 261-66.000.
Conoco, Inc.: *See*—
Weimer, Dean R.; and Starks, Charles M., 4,229,598, Cl. 568-792.000.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene naphthalene sulfonic acid intermediates. 4,229,371, Cl. 260-507.00R.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Ureylenebis(anionic substituted phenylene carbonyl)imino naphthalene sulfonic acids and naphthalene carboxylic acids and their salts. 4,229,584, Cl. 560-13.000.
Conrow, Ransom B.: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,229,370, Cl. 260-506.000.

Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,229,372, Cl. 260-507.00R.

Consigli, Armando; and Danna, Roberto, to Societa Italiana Telecomunicazioni Siemens S.p.A. Interface unit facilitating communication between data processor and program-interrupting peripheral unit. 4,229,788, Cl. 364-200.000.

Continental Group, Inc., The: *See*—
Lecinski, Frank H., Jr., 4,228,909, Cl. 215-253.000.

Coolidge, Jimmy R.: *See*—
Bennett, James D.; Coolidge, Jimmy R.; and Murphy, Clifford E., 4,229,408, Cl. 422-5.000.

Coppin, Roland; and Ghislain, Andre, to Ateliers de Constructions Electriques de Charleroi (ACEC). Apparatus for securing a metal hoop onto a metal rim. 4,229,117, Cl. 403-370.000.

Copple, Christopher J.: *See*—
Dakin, John; O'Donnell, Dennis; and Copple, Christopher J., 4,228,642, Cl. 57-263.000.

Copple, Virgil E.: *See*—
Brown, Bruce W.; Copple, Virgil E.; and Wilson, Carroll K., 4,229,485, Cl. 426-305.000.

Corbic, Yves J., to Gatrun Anstalt. Method for manufacturing, filling and closing a receptacle made of thermoplastic material. 4,228,633, Cl. 53-412.000.

Cordes, Claus: *See*—
Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, 4,229,551, Cl. 525-337.000.

Corning Glass Works: *See*—
Love, Walter F., 4,229,067, Cl. 350-96.150.
Olshansky, Robert; and Sarkar, Arnab, 4,229,070, Cl. 350-96.310.

Corti, Christopher W.; Luthi, Rolf; and Vogt, Ernst, to BBC Brown, Boveri & Company, Limited. Process for the isothermal forging of a work piece. 4,228,670, Cl. 72-42.000.

Cosack, Klaus: *See*—
Hein, Wolfgang; and Cosack, Klaus, 4,229,306, Cl. 210-446.000.

Costruxioni Elettriche Automatiche Impianti (C.E.A.I): *See*—
Vigano, Carlo; Quattrone, Francesco; and Toffanetti, Erio, 4,229,645, Cl. 235-92.0QC.

Costruzioni Meccaniche Industriali Genovesi C.M.I. S.p.A.: *See*—
Zinno, Oscar; and Tocchella, Antonio, 4,229,034, Cl. 294-81.0SF.

Cothary, Walter G. Wheeled suitcase with extendable handle means. 4,228,877, Cl. 190-18.00A.

Cotter, Robert J.; and Gardner, Hugh C., to Union Carbide Corporation. Novel bis(half ester) and compositions containing the same. 4,229,559, Cl. 526-271.000.

Covington, James W.; and Whittemore, Robert G., to Interox Chemicals Limited. Metal extraction. 4,229,422, Cl. 423-20.000.

Cowling, Edgar C., to Phillips Petroleum Company. Chiller with means for mixing hot vapors with cold or refrigerated liquid. 4,228,845, Cl. 165-1.000.

Coxwells, Incorporated: *See*—
Caton, Myron A., 4,228,746, Cl. 109-59.00T.

Cragoe, Edward J., Jr.: *See*—
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,229,456, Cl. 424-256.000.

Craig, Brian W., to Baxter Travenol Laboratories, Inc. Tear path products, method and apparatus. 4,229,407, Cl. 264-519.000.

Crandall, William B.; and Wasserstein, Linda J., to Alfred University Research Foundation, Inc. Ceramic utensils. 4,229,494, Cl. 428-35.000.

Crawford Collets Limited: *See*—
Franklin, Reginald A., 4,229,130, Cl. 409-234.000.

Crawford, Robert J., to Procter & Gamble Company, The. Synthesis of 1,4-bis(dicyanomethylene) cyclohexane. 4,229,364, Cl. 260-464.000.

Credit du Nord International N.V.: *See*—
Rickards, Anthony F., 4,228,803, Cl. 128-419.0PG.

Croese, Hendrik M. W., to Ir. H.M.W. Croese Raadgevend. Satellite reel. 4,228,966, Cl. 242-54.00R.

Cronin, Dennis C., to Beloit Corporation. Extended nip press with special belt reinforcement. 4,229,253, Cl. 162-358.000.

Crook, Douglas H. Behind door shelf assembly. 4,228,743, Cl. 108-31.000.

Crosby, Lawton H., to Morley Furniture Spring Corporation. Seat spring assembly and spring unit. 4,228,991, Cl. 267-110.000.

Crothers, William G., to Deer Park Baking Co. Method and apparatus to make cookies. 4,229,487, Cl. 426-496.000.

Crouthamel, Carl E.: *See*—
Johnson, Carl E.; and Crouthamel, Carl E., 4,229,260, Cl. 176-82.000.

Crowe, Thomas J., to Crowe, Thomas J. Air-expanded mandrel having means to equalize expansion to obtain concentric chucking. 4,229,014, Cl. 279-2.00A.

Cubic Corporation: *See*—
En, John, 4,229,824, Cl. 375-119.000.

Cubic Western Data: *See*—
Heldwein, Carl A.; Jekel, Richard N.; Sampson, Stephen R.; and Zupan, John T., 4,229,737, Cl. 343-6.00R.

Cuffe, Patricia M.: *See*—
Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., 4,229,228, Cl. 106-287.140.

Culley, Bobby G.; and Surtani, Kishin, to Texas Instruments Incorporated. Automated liquid crystal display process. 4,228,574, Cl. 29-25.130.

Cummiskey, Peter, to Bell Telephone Laboratories, Incorporated. Full duplex bit synchronous data rate buffer. 4,229,815, Cl. 370-84.000.

Cunningham, Hilary H. Fastener recess. 4,228,723, Cl. 81-460.000.

Cusato, Anthony J.; and Goodman, Jerome J., to Goodman, Jerome J. Paralleling tool or gauge for general dentistry. 4,229,166, Cl. 433-72.000.

Custode, Frank Z., to Rockwell International Corporation. Fabrication of very large scale integrated circuits containing N-channel silicon gate nonvolatile memory elements. 4,229,755, Cl. 357-41.000.

Cutter Laboratories, Inc.: *See*—
Coan, Michael H., 4,229,540, Cl. 435-219.000.

D. Swarovski & Co.: *See*—
Schwab, Kurt, 4,229,077, Cl. 350-293.000.

Dacey, Raymond G.: *See*—
Steels, Gordon; and Dacey, Raymond G., 4,229,484, Cl. 426-279.000.

Dahl, Klaus J., to Raychem Corporation. Friedel-Crafts polymerization of monomers in the preparation of polyketones and polysulfones. 4,229,564, Cl. 528-175.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Arai, Eisuke; Kamei, Kuniaki; Kawasaki, Akio; Takagi, Fumio; Shirai, Koichi; and Orihara, Yasuharu, 4,229,239, Cl. 156-155.000.

Daikhovskaya, Evelina A.: *See*—
Lesokhin, Albert Z.; Daikhovskaya, Evelina A.; and Boguslavsky, Ilya Z., 4,229,671, Cl. 310-198.000.

Daimler-Benz Aktiengesellschaft: *See*—
Jahn, Walter, 4,228,968, Cl. 242-107.000.
Peitsmeier, Karl; and Link, Manfred, 4,229,062, Cl. 339-82.000.
Schmid, Walter; Wilfert, Karl, deceased; and Wilfert, Thomas, legal heir, 4,229,021, Cl. 280-787.000.

Dairy Systems, Inc.: *See*—
Heidecker, Robert F.; and Harwood, Edward D., 4,228,763, Cl. 119-14.080.
Plett, Carl E., 4,228,764, Cl. 119-14.080.

Daiwa Shinku Corporation: *See*—
Ueda, Hirotada; and Ihara, Satoshi, 4,229,075, Cl. 350-269.000.

Dakin, John; O'Donnell, Dennis; and Copple, Christopher J., to Platt Saco Lowell Limited. Method and apparatus for stopping an open-end spinning machine. 4,228,642, Cl. 57-263.000.

D'Amico, John J., to Monsanto Company. Process for preparing thioesters. 4,229,578, Cl. 548-165.000.

Damiguet, Jean J.: *See*—
Kraszewski, Richard; and Damiguet, Jean J., 4,229,225, Cl. 106-99.000.

Daniel, Jerry W.: *See*—
Daniel, Linda A., 4,228,596, Cl. 35-9.00B.

Daniel, Linda A., to Daniel, Jerry W., a part interest. Illuminated teaching device and board game. 4,228,596, Cl. 35-9.00B.

Danna, Roberto: *See*—
Consigli, Armando; and Danna, Roberto, 4,229,788, Cl. 364-200.000.

Danos, Michael. Radiation scanning method and apparatus. 4,229,651, Cl. 250-272.000.

Danos, Michael. Visibility expander. 4,229,764, Cl. 358-160.000.

Dansk Industri Syndikat, A/S: *See*—
Gunnergaard, Marius; and Jacobsen, Ole A., 4,228,892, Cl. 198-832.000.

Daryl, Gregory: *See*—
Sustek, Alvin J., Jr.; Frazier, Terry L.; and Daryl, Gregory, 4,228,855, Cl. 166-250.000.

Data General Corporation: *See*—
Frissell, John M., 4,229,699, Cl. 328-63.000.
Whipple, David L., 4,229,801, Cl. 364-748.000.

Dataproducts Corporation: *See*—
Van Horne, Arthur C., 4,229,114, Cl. 400-692.000.

Date, Nobuaki; Kozuki, Susumu; and Iwashita, Tomonori, to Canon Kabushiki Kaisha. Motor drive device for a camera. 4,229,091, Cl. 354-173.000.

Datotek, Inc.: *See*—
Morgan, Barrie O.; and Carter, Merlon B., 4,229,817, Cl. 375-2.000.

Daugherty, Jack D.: *See*—
Mani, Siva A.; Hyman, Howard A.; and Daugherty, Jack D., 4,229,708, Cl. 331-94.50G.

d'Auria, Luigi; and Huignard, Jean-Pierre, to Thomson-CSF. Electro-optical switching apparatus. 4,229,071, Cl. 350-150.000.

Davini, Giorgio, to Basfer S.R.L. Spray gun. 4,228,957, Cl. 239-300.000.

Davis, James P.; and Smith, Robert W., to Keystone Consolidated Industries, Inc. Package strapping device with pallet sensing means. 4,228,733, Cl. 100-4.000.

Davis, Roger D.: *See*—
Lilly, Robert L.; Tummers, Gerardus L. J.; Johnson, Claude D.; and Davis, Roger D., 4,229,813, Cl. 368-89.000.

Davis, Sydney; and Durkin, John M., to United States of America, Navy. Fluidic controlled diffusers for turbopumps. 4,228,753, Cl. 114-67.00A.

Davison, Richard R.; Harris, William B.; and Maldonado, Salomon. Solar heater. 4,228,790, Cl. 126-444.000.

Dawson, David G.; Osmond, Desmond W. J.; Skinner, Maurice W.; and West, Edmund J., to Imperial Chemical Industries Limited. Cementitious compositions. 4,229,224, Cl. 106-90.000.

Day, Frederick L. Insert travel chair and method of transporting the handicapped. 4,229,039, Cl. 297-232.000.

Day, Henry, to Monier Limited. Coating uncured cementitious roofing tiles. 4,229,503, Cl. 428-451.000.

Dayco Corporation: *See*—
Jacob, Richard J.; and Waugh, Dale L., 4,228,692, Cl. 474-251.000.

Deaton, David W. Suction receptacle with hygroscopic filter. 4,228,798, Cl. 128-276.000.

Deaton, Willis R.; Clark, John L., Jr.; and Raynor, Harold M., to City of Charlotte. Portable electronic traffic event recorder. 4,229,726, Cl. 340-38.00R.

Debrauwere, Jack J. A.: *See*—
Robinson, Carleton D.; and Debrauwere, Jack J. A., 4,228,835, Cl. 150-8.000.

Decker, Elmer L.; Moon, James; and Maxwell, Paul R., to Decker Engineering Corporation. Variable cable hoisting system having quick disconnect deadline load indicating apparatus. 4,228,682, Cl. 73-143.000.

Decker Engineering Corporation: *See*—
Decker, Elmer L.; Moon, James; and Maxwell, Paul R., 4,228,682, Cl. 73-143.000.

Dederer, Guenter; and Muerkl, Helmut, to Siemens Aktiengesellschaft. Spot welding assembly for electrical resistance welding. 4,229,637, Cl. 219-86.250.

Deer Park Baking Co.: *See*—
Crothers, William G., 4,229,487, Cl. 426-496.000.

Deere & Company: *See*—
Kass, John J.; and Johannsen, Donald O., 4,229,144, Cl. 417-222.000.
Rabe, David L.; Hudson, Colin M.; and Soteropulos, Gust, 4,228,638, Cl. 56-341.000.
Thompson, James E.; and Mayfield, Robert L., 4,228,984, Cl. 248-636.000.
Woodbury, Larry A., 4,228,879, Cl. 192-4.00A.

DeFilippi, Louis J., to UOP Inc. Process for preparing immobilized enzymes. 4,229,536, Cl. 435-176.000.

de Francisco Mesado, Jose Luis. Devices for operating variable-pitch propellers. 4,229,141, Cl. 416-157.00R.

Degler, Howard E., Jr.; Clark, David E.; Hren, John J.; Jenkins, David A.; and Johnson, Paul F., III, to Concept, Inc. Bipolar electrosurgical knife. 4,228,800, Cl. 128-303.140.

de Jager, Frank; Dekker, Cornelis B.; and Muilwijk, Dirk, to U.S. Philips Corporation. System for data transmission by means of an angle-modulated carrier of constant amplitude. 4,229,821, Cl. 375-53.000.

Dekker, Cornelis B.: *See*—
de Jager, Frank; Dekker, Cornelis B.; and Muilwijk, Dirk, 4,229,821, Cl. 375-53.000.

Delano, Frank P.: *See*—
Smith, Bernard; and Delano, Frank P., 4,228,750, Cl. 114-39.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Fluorovitamin D compounds and processes for their preparation. 4,229,357, Cl. 260-397.200.

DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Fluorovitamin D compounds and processes for their preparation. 4,229,358, Cl. 260-397.200.

DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., to Wisconsin Alumni Research Foundation. Derivatives of 25-hydroxycholecalciferol. 4,229,359, Cl. 260-397.200.

Demers, Robert R.; and Leedom, Marvin A., to RCA Corporation. System for regulating the applied blade-to-boule force during the slicing of wafers. 4,228,782, Cl. 125-14.000.

Deminski, Richard M., to Yorde Machine Products Company, The. Seat guided poppet valve having flow and dampening control means. 4,228,820, Cl. 137-514.300.

Demray, Jack: *See*—
Englert, Herbert U.; and Demray, Jack, 4,228,630, Cl. 52-656.000.

Denelcor, Inc.: *See*—
Gilliland, Maxwell C.; Smith, Burton J.; and Ferguson, Gary L., 4,229,790, Cl. 364-200.000.

Dentsply Research & Development Corp.: *See*—
Gonser, Donald I., 4,229,658, Cl. 250-504.00H.

Depersia, Anthony T.: *See*—
Bly, Vincent T.; and Depersia, Anthony T., 4,229,078, Cl. 350-353.000.

Derby, Jeffrey H.; and Rao, Tadikonda N., to Bell Telephone Laboratories, incorporated. Repeater level control circuit. 4,229,625, Cl. 179-170.00R.

Desnick, Shirley. Soap bag. 4,228,834, Cl. 150-3.000.

DeSoto, Inc.: *See*—
Sicklesteel, Bruce G.; and Anders, Dale F., 4,229,336, Cl. 260-29.6NR.

DeTrano, Mario: *See*—
Bohm, Georg G. A.; and DeTrano, Mario, 4,228,839, Cl. 152-347.000.

Deutsche Forschungs- und Versuchsanstalt fur Luftund Raumfahrt e.V.: *See*—
Klipping, Gustav, 4,228,662, Cl. 62-216.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Wolff, Siegfried; and Tan, Ewe H., 4,229,333, Cl. 260-23.70M.

Devendorf, Don C.; and Baskevitch, Eugene, to Hughes Aircraft Company. Analog to digital converter utilizing a quantizer network. 4,229,729, Cl. 340-347.0AD.

Dever, Alfred J. Bearing assembly. 4,229,059, Cl. 308-236.000.

De Vivo, Alessandro; Pierantozzi, Gianni; Santarpia, Diodato; and Spolverini, Renzo. Apparatus for treatment of the person. 4,228,557, Cl. 15-21.00E.

Dewit, Guillaume: *See*—
Beyens, Jozef; Dewit, Guillaume; and Lambrechts, Jules, 4,228,927, Cl. 222-148.000.

Di Camillo, Carmen A.: *See*—
Tulenko, Thomas N.; and Di Camillo, Carmen A., 4,229,733, Cl. 340-500.000.

Dickey, Richard P. Intravaginal contraception method. 4,228,797, Cl. 128-270.000.

Diem, Hans: *See*—
Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, 4,229,590, Cl. 560-174.000.

Diesel Kiki Co., Ltd.: *See*—
Isizuka, Yutaka, 4,229,145, Cl. 417-269.000.

Dietmann, Karl: *See*—
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.

Dietrich, Rainer. Method of producing abrasive compacts. 4,228,942, Cl. 228-121.000.

Di Giacomo, Augusto: *See*—
Beauchamp, Pierre; and Di Giacomo, Augusto, 4,228,980, Cl. 248-262.000.

Digital Equipment Corporation: *See*—
Levy, John V.; Rodgers, David; Stewart, Robert E.; Potter, David; and Casabona, Richard J., 4,229,791, Cl. 364-200.000.

Dimroth, Peter: *See*—
Junge, Helmut; Kurtz, Walter; Dimroth, Peter; and Scherer, Hans, 4,229,343, Cl. 260-156.000.

Dingler, Geoffrey L.; and Johnson, Philip P., to Whirlpool Corporation. Comminuting liquid swirler. 4,228,962, Cl. 241-46.00R.

Dinsdale, Raymond, to Rolls-Royce Limited. Control of an electro-discharge machine tool. 4,229,635, Cl. 219-69.00G.

Dislich, Helmut; Hinz, Paul; and Wolf, Gunther, to JENAer Glaswerk Schott & Gen. Process for producing cadmium stannate layers. 4,229,491, Cl. 427-160.000.

Displaytek Corporation: *See*—
Ueda, Hirotada; and Ihara, Satoshi, 4,229,075, Cl. 350-269.000.

Dittmann, Manfred K.: *See*—
Blake, Frederick H.; and Dittmann, Manfred K., 4,229,664, Cl. 307-117.000.

Dixon, Guy E., to Panelfold Doors, Inc. Extruded material folding door with panel lock. 4,228,841, Cl. 160-183.000.

Dixon, John, Jr.: *See*—
Vaselich, Raymond A.; and Dixon, John, Jr., 4,229,659, Cl. 250-554.000.

Djiane, Alain C.: *See*—
Cherqui, Jean S.; and Djiane, Alain C., 4,229,428, Cl. 424-19.000.

Dobaj, Edward: *See*—
Koloczek, Wiktor; Dobaj, Edward; and Zaremba, Tadeusz, 4,229,721, Cl. 336-133.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Haese, Egon, 4,229,419, Cl. 422-197.000.

Dr. Johannes Heidenhain GmbH: *See*—
Burkhardt, Horst, 4,229,647, Cl. 235-92.0GC.

Dodge, Charles W.: *See*—
Frost, Richard H.; and Dodge, Charles W., 4,228,568, Cl. 24-230.00R.

Doi, Yoshir ıo: *See*—
Nohmi, Takashi; Yamada, Takao; and Doi, Yoshinao, 4,229,297, Cl. 210-654.000.

Dolbeare, Frank A.: *See*—
Smith, Robert E.; and Dolbeare, Frank A., 4,229,528, Cl. 435-23.000.

Domtar, Inc.: *See*—
Temler, Jan S., 4,229,251, Cl. 162-28.000.

Donaldson, Charles R.; and Stiles, Claude J., to National Distillers and Chemical Corporation. Dual reactor apparatus for polymerizing ethylene. 4,229,416, Cl. 422-134.000.

Donovan, Joseph C.: *See*—
Leister, Harry M.; Donovan, Joseph C.; and Hall, Wilbur S., 4,229,492, Cl. 427-345.000.

Donth, Rudolf: *See*—
Heck, Gunter; Roscher, Gunter; and Donth, Rudolf, 4,229,261, Cl. 203-14.000.

Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. 3-(Halopyrazolyl)-7-triazolyl-coumarin compounds. 4,229,579, Cl. 548-256.000.

Dornau, Peter G.; and Spector, Arthur. Labelled bottle-boat fender. 4,228,758, Cl. 114-219.000.

Dorschner, Terry A.; Smith, Irl W., Jr.; and Statz, Hermann, to Raytheon Company. Electromagnetic wave ring resonator. 4,229,106, Cl. 356-350.000.

Doucet, Laurent. Offset duplicating machine. 4,228,735, Cl. 101-227.000.

Douville-Johnston Corporation: *See*—
McCoy, Christopher B., 4,228,664, Cl. 64-14.000.

Dover Corporation: *See*—
Oberrecht, David A.; and Wilson, Fred A., 4,229,024, Cl. 285-98.000.

Dow Chemical Company, The: *See*—
Lyon, George W., 4,229,603, Cl. 585-444.000.
Norman, Paula R., 4,229,362, Cl. 260-410.600.
Suh, Kyung W.; and Amos, Charles R., 4,229,396, Cl. 264-53.000.
Zweigle, Maurice L., 4,229,572, Cl. 536-89.000.

Drago, James A.: *See*—
Savitz, Steven R.; and Drago, James A., 4,229,299, Cl. 210-85.000.

Dreano, Claude; and Noyelle, Andre, to Armor-Inox S.A. Method of pickling pieces of meat. 4,229,458, Cl. 426-264.000.

Dresser Industries, Inc.: *See*—
Garrison, Stephen N., 4,228,889, Cl. 198-501.000.
Lichte, Carl L., 4,229,638, Cl. 219-121.0EM.

Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., to Polaroid Corporation. Film pack for small format film sheets. 4,229,090, Cl. 354-86.000.

Drost, Edward J. Portable folding table and chairs. 4,229,038, Cl. 297-139.000.

Drouin, Andre H.: *See*—
Barnett, Robert D.; Morrill, Charles D.; and Drouin, Andre H., 4,228,704, Cl. 81-57.390.

Druin, Melvin L.; and Gall, John S., to Celanese Corporation. Glass fiber-reinforced polyethylene terephthalate/polyamide blends. 4,229,340, Cl. 260-40.00R.

Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, to BASF Aktiengesellschaft. Preparation of alkyl pyruvates. 4,229,590, Cl. 560-174.000.

Dufault, Armand A. Thread control for buttonhole sewing machine. 4,228,748, Cl. 112-65.000.

Duke University, Inc.: *See*—
Haagensen, Darrow E., Jr., 4,229,426, Cl. 424-1.000.

Dumond, Vernon, to Champion International Corporation. Stairstep display rack. 4,228,904, Cl. 211-55.000.

Dunkel, Franz-Heinz; Klinkhammer, Ralf L.; Nebel, Heinz; Spanner, Siegfried; and Seibel, Gerd, to AGFA-Gevaert, A.G. Method and apparatus for winding a strip of film and for inserting it in a cassette. 4,228,579, Cl. 29-430.000.

Dunlop Limited: *See*—
Evans, Brian; and Calverley, Maurice, 4,228,824, Cl. 138-119.000.
Harvey, Richard G., 4,229,398, Cl. 264-113.000.

Dunn, William M.: *See*—
Hodge, Malcolm H.; and Dunn, William M., 4,229,068, Cl. 350-96.200.

Du Pont de Nemours, E. I., and Company: *See*—
Bratt, Martin D.; and Cohen, Abraham B., 4,229,517, Cl. 430-271.000.
Bratt, Martin D.; and Cohen, Abraham B., 4,229,520, Cl. 430-322.000.
Chaban, Castulo, Jr.; and Hawkins, Curtis O., 4,229,154, Cl. 425-72.00S.
Gray, Russell H.; and Kuchta, August D., 4,229,518, Cl. 430-273.000.
Sowell, Lyles H., 4,228,917, Cl. 220-378.000.

Durkin, John M.: *See*—
Davis, Sydney; and Durkin, John M., 4,228,753, Cl. 114-67.00A.

Dvoretsky, Mikhail L.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Dyckerhoff & Widman Aktiengesellschaft: *See*—
Kern, Georg, 4,229,501, Cl. 428-399.000.

E. J. Brooks Company: *See*—
Guiler, Richard S., 4,229,031, Cl. 292-322.000.

E-Systems, Inc.: *See*—
Betts, William L, 4,229,814, Cl. 370-62.000.

Eastman Kodak Company: *See*—
Abel, Edward P., 4,229,516, Cl. 430-215.000.
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,229,513, Cl. 430-115.000.
Mir, Jose M., 4,229,095, Cl. 355-4.000.
Petrak, Karel L., 4,229,515, Cl. 430-213.000.
Schoonmaker, Edward B.; and Moran, Paul W. T., 4,228,997, Cl. 271-315.000.
Sharp, Gerald B.; Petrak, Karel L.; Boielle, John H.; Wagner, Hans M.; and Langford, John F., 4,229,519, Cl. 430-287.000.
Suggs, James L.; and Buck, Dan F., 4,229,480, Cl. 426-24.000.
Suggs, James L.; and Buck, Dan F., 4,229,488, Cl. 426-557.000.

Easy Engineering Corporation: *See*—
Brady, John H., 4,228,964, Cl. 241-186.300.

Eaton Corporation: *See*—
Gee, Thomas A., 4,228,880, Cl. 192-58.00B.
Krieg, John J., 4,228,771, Cl. 123-90.550.
Tremba, Joseph A., 4,229,728, Cl. 340-58.000.
Varner, James P., 4,228,956, Cl. 239-237.000.

Eberhardt, Hans: *See*—
Brickl, Rolf; Eberhardt, Hans; Appel, Karl-Richard; Lechner, Uwe; and Merk, Walter, 4,229,479, Cl. 424-331.000.

Eberhardt, Noel, to Timex Corporation. Backlight for electrooptic display. 4,229,783, Cl. 362-352.000.

Ebihara, Heihachiro; and Sekiya, Fukuo, to Citizen Watch Co., Ltd. Transistor circuit having a plurality of CMOS circuits. 4,229,668, Cl. 307-304.000.

Eckert, Ronald P., to Thomas A. Schutz Co., Inc. Gravity feed can dispenser for beverage coolers. 4,228,903, Cl. 211-49.00D.

Edwards, Stephen: *See*—
Mowbray, Dorian F.; and Edwards, Stephen, 4,228,960, Cl. 239-533.900.

Eger, Kurt: *See*—
Roth, Hermann J.; Eger, Kurt; Issa, Sedika; and Jacobi, Haireddin, 4,229,453, Cl. 424-251.000.

Eggermont, Ludwig D. J., to U.S. Philips Corporation. Digital adding device. 4,229,802, Cl. 364-786.000.

Egyt Gyogyszervegyeszeti Gyar: *See*—
Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, 4,229,350, Cl. 260-243.300.

Ehmann, Roland: *See*—
Linder, Ernst; Rembold, Helmut; Teegen, Walter; Kessler, Achill; and Ehmann, Roland, 4,229,147, Cl. 417-283.000.

Ehrenhaft, Franz F., to Anamorphic Ltd. Additive color system with compensation of repeatability errors of variable-density electrooptical filter units. 4,229,648, Cl. 250-205.000.

Eidenschink, Rudolf: *See*—
Krause, Joachim; Eidenschink, Rudolf; and Pohl, Ludwig, 4,229,315, Cl. 252-299.000.

Eiselbrecher, Max; Guenther, Rolf; and Jakob, Helmut, to Messerschmitt-Bolkow-Blohm GmbH. Main connector for an airfoil or wing. 4,228,976, Cl. 244-123.000.

Eisenwerke Friedr. Wilh. Duker GmbH & Co.: *See*—
Seiler, Georg, 4,229,026, Cl. 285-105.000.

Ekok Corporation, The: *See*—
Pinckard, Joseph A., 4,229,442, Cl. 424-195.000.

El Paso Polyolefins Company: *See*—
Wikelski, Karl W.; and Tyson, Henry K., 4,229,011, Cl. 277-72.0FM.

Elbe, Hans-Ludwig: *See*—
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.

Elber, Wolf, to United States of America, National Aeronautics and Space Administration. Partial interlaminar separation system for composites. 4,229,473, Cl. 428-113.000.

Electric Power Research Institute, Inc.: *See*—
Rostron, Joseph R., 4,229,627, Cl. 200-144.00R.

Electrolux Corporation: *See*—
Borgiani, Olivio, 4,229,240, Cl. 156-214.000.

Elektromedical Company S.r.l.: *See*—
Magnasco, Dante; and Marinoni, Livio, 4,228,801, Cl. 128-344.000.

Elkins, Christopher W.: *See*—
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,229,634, Cl. 200-302.000.

Ellinor, Daniel H. Resiliently stabilized web movement for honeycomb machine. 4,229,243, Cl. 156-269.000.

Elmo Company Limited: *See*—
Nonogaki, Masahiko, 4,229,074, Cl. 350-187.000.

Elson, James T. Pressurized fluid-dispensing apparatus. 4,228,933, Cl. 222-400.700.

Emery Industries, Inc.: *See*—
Sharkey, Hubert J., 4,229,567, Cl. 528-338.000.

Emhart Industries, Inc.: *See*—
Ring, Thomas F., 4,228,690, Cl. 74-122.000.

EMI Limited: *See*—
Fraser, Brian W., 4,228,687, Cl. 73-626.000.

En, John, to Cubic Corporation. Method and apparatus for synchronizing electrical signals. 4,229,824, Cl. 375-119.000.

Endo, Hisao: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.

Endo, Mitsushi: *See*—
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Eneroth, Jan-Mats; and Nordfeldt, Sven A., to AB Svenska Flaktfabriken. Method of refining solid fuel of organic vegetable material. 4,229,183, Cl. 44-1.00D.

Engel, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Device for detecting the onset of fuel injection. 4,228,680, Cl. 73-119.00A.

Engelhard Minerals & Chemicals Corporation: *See*—
Lepetic, Vuko M., 4,229,287, Cl. 209-167.000.

Engert, Klaus, to ITT Industries, Inc. Brake force regulator for a motorcycle hydraulic brake system. 4,229,050, Cl. 303-6.00C.

Englert, Herbert U.; and Demray, Jack, to Englert Metals Corp. Window frame construction. 4,228,630, Cl. 52-656.000.

Englert Metals Corp.: *See*—
Englert, Herbert U.; and Demray, Jack, 4,228,630, Cl. 52-656.000.

Englund, James A.: *See*—
Chalmers, Alexander A.; Gailey, J. Lynn; Englund, James A.; and Popek, Stephen, 4,228,629, Cl. 52-460.000.

Enomoto, Hajime, to Kakusai Denshin Denwa Kabushiki Kaisha. Multistage selective differential pulse code modulation system. 4,229,820, Cl. 375-27.000.

Enomoto, Kunio: *See*—
Matsuda, Noriaki; and Enomoto, Kunio, 4,229,235, Cl. 148-127.000.

Environmental Chemicals, Inc.: *See*—
Cardarelli, Nathan F., 4,228,614, Cl. 43-131.000.

Envirotech Corporation: *See*—
Fismer, William L., 4,229,304, Cl. 210-231.000.

Eppendorf Geratebau Netheler & Hinz GmbH: *See*—
Lahme, Gerhard; Solter, Dieter; and Bohnsack, Hermann, 4,229,104, Cl. 356-246.000.

Eppinger, Kurt H.; and Jackson, Mervyn B., to ICI Australia Limited. Matrix amphoteric thermally regenerable ion exchange resins. 4,229,545, Cl. 521-38.000.

EPS (Research and Development) Limited: *See—*
Harris, Clifford E.; and Spary, Norman B., 4,228,912, Cl. 220-4.00R.
Ericsson, Lars A.: *See—*
Wiklund, Klas R.; and Ericsson, Lars A., 4,229,102, Cl. 356-5.000.
Ernohazy, Stephen; Meller, Frederick D.; and Oddo, Eugene P., to AM International, Inc. Apparatus for measuring liquid developer flow rate. 4,228,921, Cl. 222-40.000.
Eroyan, Gary. Self-securing box construction. 4,228,947, Cl. 229-39.00R.
Errett, Paul W., to Airtek, Inc. Air compressors. 4,229,146, Cl. 417-281.000.
Ertel, Werner, to Bayer Aktiengesellschaft. Production of semi-synthetic β-lactam antibiotics. 4,229,349, Cl. 260-239.100.
ESB Technology Company: *See—*
Margalit, Nehemiah, 4,229,509, Cl. 429-194.000.
Escher Wyss Aktiengesellschaft: *See—*
Biondetti, Mario, 4,228,571, Cl. 29-116.0AD.
Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,228,576, Cl. 29-407.000.
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, to Robert Bosch GmbH. Automatic transmission with electronically controlled torque transmission during gear shift. 4,228,700, Cl. 74-866.000.
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, to Institut Francais du Petrole. Method for determining oil-related characteristics of geological sediments from small samples thereof. 4,229,181, Cl. 23-230.0EP.
Essilor International Compagnie Generale d'Optique: *See—*
Wajs, Georges H., 4,229,273, Cl. 204-159.130.
Evans, Anthony C.: *See—*
Rinker, Kurt H.; and Evans, Anthony C., 4,228,726, Cl. 92-168.000.
Evans, Brian; and Calverley, Maurice, to Dunlop Limited. Hose. 4,228,824, Cl. 138-119.000.
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., to Ciba-Geigy AG. Yellow photographic color couplers containing 3-imino-1,3,4-thiadiazolyl-4 groups. 4,229,577, Cl. 348-138.000.
Evans, James M.: *See—*
Ting, Vincent W.; and Evans, James M., 4,229,335, Cl. 260-29.40R.
Evers, Robert C.; Arnold, Fred E.; and Helminiak, Thaddeus E., to United States of America, Air Force. Articulated para-ordered aromatic heterocyclic polymers containing diphenoxybenzene structures. 4,229,566, Cl. 528-185.000.
Exxon Research & Engineering Co.: *See—*
Brenner, Douglas, 4,229,337, Cl. 260-32.60A.
Kramer, George M., 4,229,611, Cl. 585-728.000.
Krutenat, Richard C.; and Liu, Chih-an, 4,229,234, Cl. 148-105.000.
O'Neil, John B., 4,228,641, Cl. 57-234.000.
Sosnowski, John, 4,229,283, Cl. 208-127.000.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy Joseph P., 4,229,325, Cl. 260-5.000.
Fahim, Mostafa S.; and Miller, Ercell L. Oral composition for improving oral health. 4,229,430, Cl. 424-49.000.
Fairchild Industries, Inc.: *See—*
Howell, Russell B.; and Marrujo, Ralph G., 4,229,040, Cl. 297-355.000.
Fansteel Inc.: *See—*
Heisner, Marvin M., 4,228,705, Cl. 82-36.00R.
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Farmitalia Carlo Erba: *See—*
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Farmitalia Carlo Erba, S.p.A.: *See—*
Melloni, Piero; Torre, Arturo D.; Carniel, Giovanni C.; and Rossi, Alessandro, 4,229,449, Cl. 424-248.580.
Fashion Ribbon Company Inc.: *See—*
Rosenzweig, William, 4,228,954, Cl. 239-60.000.
Fecondini, Luciano; and Bocchi, Andrea, to Hospal Ltd. Haemodialyzer. 4,229,305, Cl. 210-321.00B.
Feder, Joseph: *See—*
Tolbert, William R.; Feder, Joseph; and Kuo, Mau-Jung, 4,229,531, Cl. 435-41.000.
Tolbert, William R.; and Feder, Joseph, 4,229,532, Cl. 435-41.000.
Fehr, Theodor; and Stadler, Paul, to Sandoz Ltd. Ergopeptine derivatives. 4,229,451, Cl. 424-250.000.
Fehr, Werner: *See—*
Thommen, Werner F.; Fehr, Werner; and Korom, Arpad, 4,229,670, Cl. 307-360.000.
Feinauer, Dieter; and Streinz, Ludwig, to Ciba-Geigy Corporation. Process for the production of white melamine-phenol-aldehyde resins which are resistant to yellowing. 4,229,557, Cl. 525-480.000.
Feldman, Martin L.; Goodman, Donald; Koral, Marvin; Miller, Robert S.; and Stanaback, Robert J., to Tenneco Chemicals, Inc. Process for the removal of vinyl chloride from aqueous slurries of vinyl chloride polymers. 4,229,569, Cl. 528-501.000.
Feldy, Edmund C.: *See—*
Bellino, Joseph A.; Feldy, Edmund C.; LaSpesa, Richard E.; and Ramig, Robert J., Jr., 4,229,617, Cl. 178-92.000.
Felson, Lucille Likens: *See—*
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Felsvang, Karsten S.; and Hansen, Ove E., to A/S Niro Atomizer. Production of a powder of polyvinylchloride or a vinylchloride copolymerizate suitable for producing plastisols. 4,229,249, Cl. 159-4.00B.
Ferag AG: *See—*
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Ferguson, Gary L.: *See—*
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Ferrari, Giorgio; and Vecchietti, Vittorio, to Simes Societa Italiana Medicinali e Sintetici S.p.A. Carbamates of homolysergols (8β-hydrohyethylergolines) and compositions thereof. 4,229,450, Cl. 424-248.520.
Fiat Veicoli Industriali S.p.A.: *See—*
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Fiber Industries, Inc.: *See—*
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Fiberite Corporation: *See—*
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Fibre-Chem Corporation: *See—*
Bendiner, Bernard; and Margolis, Barry I., 4,229,493, Cl. 428-2.000.
Fillmore, Gary L., to International Business Machines Corporation. Ink drop compensation based on print-data blocks. 4,229,749, Cl. 346-75.000.
Filson, Lucille L., heir: *See—*
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Finkelstein, Richard A.; and Payne, Shelley M., to Board of Regents, University of Texas System. Methods and media for rapid detection of pathogenic neisseria. 4,229,530, Cl. 435-37.000.
Finlay, Thomas H.: *See—*
Hodgins, Leonard T.; Finlay, Thomas H.; and Johnson, Alan J., 4,229,537, Cl. 435-177.000.
Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A.; and DeTrano, Mario, 4,228,839, Cl. 152-347.000.
Fisher, Glen W., to Technovators, Inc. Stream throttle. 4,228,822, Cl. 138-46.000.
Fismer, William L., to Envirotech Corporation. Molded thermoplastic filter plate. 4,229,304, Cl. 210-231.000.
Fitzgibbon, Thomas F., to Garrett Corporation, The. Motorized railway truck articulated shaft housing. 4,228,739, Cl. 105-136.000.
Flake, Duane W., to White, Mary W., a part interest. Gypsum with resin binder. 4,229,223, Cl. 106-88.000.
Fleissner, Heinz, to Vepa AG. Process and apparatus for the continuous dyeing of lengths of material consisting at least partly of cellulose fibers. 4,229,173, Cl. 8-519.000.
Fleming, David L.: *See—*
Torok, Ernest J.; Fleming, David L.; and Johansen, Thomas R., 4,229,072, Cl. 350-151.000.
Fletcher-Terry Company, The: *See—*
Insolio, Thomas A., 4,228,711, Cl. 83-881.000.
Fliege, Werner: *See—*
Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, 4,229,590, Cl. 560-174.000.
Flynn, Brian P.: *See—*
Barrett, John H.; and Flynn, Brian P., 4,229,475, Cl. 428-196.000.
FMC Corporation: *See—*
Kondo, Kiyoshi; and Suda, Minoru, 4,229,593, Cl. 562-401.000.
FMN Schuster GmbH & Co. KG: *See—*
Heim, Richard; Hermanns, Peter; and Tschentscher, Alfred, 4,228,965, Cl. 242-45.000.
Fontaine, Francis X.: *See—*
Frey, G. Robert; Parrotto, Joseph; and Fontaine, Francis X., 4,229,124, Cl. 405-303.000.
Ford Motor Company: *See—*
Hagedorn, Vincent H., 4,229,017, Cl. 280-96.100.
Heiney, Elmer T., III; and Merchant, Stanley R., 4,228,675, Cl. 73-23.000.
Rogerson, Jerry B.; Connin, Robert F.; and Benedix, Harold E., Jr., 4,229,387, Cl. 261-66.000.
Trancik, Edward R., 4,229,672, Cl. 313-139.000.
Ford, Ruby L., Jessie W. Likens, Mary F. L. Coulter, Pauline L. Coulter, heirs: *See—*
Likens, Jonas S., deceased; and Filson, Lucille L., heir, 4,229,437, Cl. 424-145.000.
Forg, Wolfgang G., to Linde Aktiengesellschaft. Method for liquifying natural gas. 4,229,195, Cl. 62-23.000.
Fornari, Hector C. Process and means to make aromatic infusions. 4,229,481, Cl. 426-77.000.
Forshee, David J. Conveyor trolley construction. 4,228,738, Cl. 104-95.000.
Forster, Herbert; and Bayer, Dieter, to Robert Bosch GmbH. Thin film structure on a ribbon substrate for electric components and manufacture thereof. 4,229,476, Cl. 428-201.000.
Forster, Siegfried, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of operating a nuclear power installation and a power plant adapted for such operation. 4,229,257, Cl. 176-60.000.
Fory, Werner: *See—*
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,229,207, Cl. 71-107.000.
Foscante, Raymond E.; Gysegem, Albert P.; and Martinich, Pamela J., to Ameron, Inc. Aromatic amidoamines. 4,229,563, Cl. 528-99.000.
Foster, Arthur M.: *See—*
Tang, David Y.; and Foster, Arthur M., 4,229,378, Cl. 568-313.000.
Foster, Colin E., to Sanitary Scale Company. Method and apparatus for supplying a label printer with product information. 4,229,794, Cl. 364-466.000.

Foszcz, Joseph L.: *See—*
Schimmel, Vernon R.; and Foszcz, Joseph L., 4,228,986, Cl. 249-202.000.

Fotomec S.p.A.: *See—*
Schmoker, Peter, 4,229,098, Cl. 355-60.000.

Fraley, Lawrence R.: *See—*
Bouchard, Andre C.; and Fraley, Lawrence R., 4,229,161, Cl. 431-362.000.

Frangatos, Gerassimos, to Mobil Oil Corporation. Lubricant compositions. 4,229,310, Cl. 252-49.900.

Frank, James G.: *See—*
Frank, Steven N.; and Frank, James G., 4,229,490, Cl. 427-113.000.

Frank, Joseph M.; and Hufnagel, Robert A., to Westinghouse Electric Corp. Internal diameter measuring apparatus. 4,228,593, Cl. 33-178.00F.

Frank, Karl; and Block, Hans-Dieter, to AGFA-Gevaert, A.G. Method of processing photographic materials. 4,229,521, Cl. 430-372.000.

Frank, Steven N.; and Frank, James G., to Texas Instruments Incorporated. Novel method for catalyst application to a substrate for fuel cell electrodes. 4,229,490, Cl. 427-113.000.

Frankenfield, Fred I., to Hedback Corp. Flow director. 4,228,786, Cl. 126-427.000.

Franklin, Kenneth; Rosenthal, William S.; and Greer, S. Thomas, to PPG Industries, Inc. Inhibition of paint-product skin formation on the interior surface of a paint vessel lid. 4,228,893, Cl. 206-205.000.

Franklin, Reginald A., to Crawford Collets Limited. Collets. 4,229,130, Cl. 409-234.000.

Frascisco, Carlo: *See—*
Gallione, Bruno; and Frascisco, Carlo, 4,228,776, Cl. 123-549.000.

Fraser, Brian W., to EMI Limited. Ultrasonic transducers. 4,228,687, Cl. 73-626.000.

Fraula, Louis F.: *See—*
Churley, George; and Fraula, Louis F., 4,229,229, Cl. 134-18.000.

Frazier, Terry L.: *See—*
Sustek, Alvin J., Jr.; Frazier, Terry L.; and Daryl, Gregory, 4,228,855, Cl. 166-250.000.

French, Barry T., to Rockwell International Corporation. CCD Imager with multi-spectral capability. 4,229,754, Cl. 357-30.000.

Frey, G. Robert; Parrotto, Joseph; and Fontaine, Francis X., to Joy Manufacturing Company. Automatic roof bolting system for mines. 4,229,124, Cl. 405-303.000.

Freyberg, Peter: *See—*
Boerzel, Paul; Freyberg, Peter; Greif, Norbert; and Widder, Rudi, 4,229,174, Cl. 8-588.000.

Friedman, Leonard: *See—*
Pringle, William L., 4,229,245, Cl. 156-382.000.

Friedrich Deckel Aktiengesellschaft: *See—*
Adam, Hans H., 4,228,694, Cl. 74-342.000.

Friedrich Munch Silber-und Alpaccawarenfabrik: *See—*
Striegel, Oskar, 4,229,496, Cl. 428-53.000.

Frissell, John M., to Data General Corporation. Multiple clock selection system. 4,229,699, Cl. 328-63.000.

Frohberger, Paul-Ernst: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Paul, Volker, 4,229,459, Cl. 424-269.000.

Frost Engineering Development Corp.: *See—*
Frost, Richard H.; and Dodge, Charles W., 4,228,568, Cl. 24-230.00R.

Frost, Richard H.; and Dodge, Charles W., to Frost Engineering Development Corp. Releasable fastener for aircraft ejection seats. 4,228,568, Cl. 24-230.00R.

Fryberg, Mario: *See—*
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,229,577, Cl. 548-138.000.

Frypan S.p.A.: *See—*
Jacobone, Donato, 4,229,327, Cl. 260-13.000.

Fuji Electric Co., Ltd.: *See—*
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,228,811, Cl. 133-3.00R.

Fuji Kiko Company, Limited: *See—*
Arima, Tatsuhiro; and Yamanashi, Chusaku, 4,228,971, Cl. 242-107.600.

Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,228,612, Cl. 43-43.130.

Fuji Oil Company, Ltd.: *See—*
Oura, Maremi; Tsumura, Haruo; and Kubota, Hayato, 4,229,483, Cl. 426-250.000.

Fuji Photo Film Co., Ltd.: *See—*
Nakamura, Shigeru; Shimamura, Isao; Nakamura, Taku; Sakaguchi, Shinji; Miyazako, Takushi; Sugiysma, Masatoshi; and Mitsui, Akio, 4,229,522, Cl. 430-390.000.
Ueda, Hirozo, 4,229,525, Cl. 430-568.000.
Watarai, Syu; Sawada, Kenichi; and Saida, Takeshi, 4,229,510, Cl. 430-38.000.
Yoneyama, Masakazu; and Kishimoto, Shinzo, 4,229,524, Cl. 430-536.000.

Fujii, Kozo: *See—*
Nishimura, Kenji; Uchiumi, Shinichiro; Fujii, Kozo; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,229,589, Cl. 560-193.000.
Nishimura, Kenji; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Uchiumi, Shinichiro, 4,229,591, Cl. 560-193.000.

Fujii, Kyoichi: *See—*
Takemoto, Yoshinori; Yasui, Toshihiro; Fujii, Kyoichi; Tanaka, Hiroshi; and Hirayama, Tatsuyuki, 4,229,446, Cl. 424-230.000.

Fujii, Takayoshi: *See—*
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,229,570, Cl. 536-18.000.

Fujikura, Yoshiaki: *See—*
Aigami, Koji; Inamoto, Yoshiaki; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,229,375, Cl. 260-563.00P.

Fujino, Masahiko; Nishimura, Osamu; and Takaoki, Muneo, to Takeda Chemical Industries, Ltd. Nonapeptides. 4,229,438, Cl. 424-177.000.

Fujitsu Fanuc Limited: *See—*
Kobayashi, Kengo; and Imazeki, Ryoji, 4,229,804, Cl. 364-900.000.

Fujiya Confectionery Company Limited: *See—*
Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, 4,229,440, Cl. 424-180.000.

Fukke, Hajime: *See—*
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.

Fukunaga, Akio: *See—*
Higashi, Kazo; Nakanishi, Sadayuki; and Fukunaga, Akio, 4,228,988, Cl. 251-327.000.

Fukuta, Kenji; Ono-Oka, Ryuzo; Yoshida, Masatoshi; Saito, Kazuhisa; and Kosuda, Hiroyuki, to Agency of Industrial Science & Technology; and Toho Beslon Co., Ltd. Method for forming fiber-reinforced composite material. 4,229,397, Cl. 264-113.000.

Funasaka, Eiichi: *See—*
Takahashi, Nobuaki; Funasaka, Eiichi; Shinozaki, Masanobu; and Kaizu, Yasuo, 4,229,619, Cl. 179-1.00D.

Furukawa Electric Co., Ltd., The: *See—*
Shimano, Takashi; Masukata, Yoshimasa; and Sato, Hiromitsu, 4,229,392, Cl. 264-40.100.

Gailey, J. Lynn: *See—*
Chalmers, Alexander A.; Gailey, J. Lynn; Englund, James A.; and Popek, Stephen, 4,228,629, Cl. 52-460.000.

Gale, Leo R.; and Heilman, Robert R., to Lockformer Company, The. Rotary notcher and former. 4,228,672, Cl. 72-130.000.

Gale, Vernon M. Variably-oriented footstool. 4,228,745, Cl. 108-116.000.

Gall, John S.: *See—*
Druin, Melvin L.; and Gall, John S., 4,229,340, Cl. 260-40.00R.

Gallione, Bruno; and Frascisco, Carlo, to Fiat Veicoli Industriali S.p.A. Fuel feed system for an internal combustion engine. 4,228,776, Cl. 123-549.000.

Gamble, George W. High-fidelity speaker with negative feedback. 4,229,618, Cl. 179-1.00F.

Gambro AB: *See—*
Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,229,542, Cl. 435-291.000.

Gamewell, Joseph M.: *See—*
Stockford, William F.; and Gamewell, Joseph M., 4,229,187, Cl. 55-14.000.

Gamewell Manufacturing, Inc.: *See—*
Stockford, William F.; and Gamewell, Joseph M., 4,229,187, Cl. 55-14.000.

Gandolfi, Carmelo: *See—*
Pellegata, Renato; and Gandolfi, Carmelo, 4,229,585, Cl. 560-55.000.

Gardiner, Marie A. Insulin injection guide. 4,228,796, Cl. 128-215.000.

Gardner, Hugh C.; and Matzner, Markus, to Union Carbide Corporation. Preparation of polyarylates from dihydric phenols, aromatic dicarboxylic acid and a chlorinating agent. 4,229,565, Cl. 528-176.000.

Gardner, Hugh C.: *See—*
Cotter, Robert J.; and Gardner, Hugh C., 4,229,559, Cl. 526-271.000.

Garner, James B.: *See—*
Bell, Roy L.; Garner, James B.; and Salmon, Douglas, 4,229,043, Cl. 299-33.000.

Garrett Corporation, The: *See—*
Fitzgibbon, Thomas F., 4,228,739, Cl. 105-136.000.

Garrett, Steven H., to Westinghouse Electric Corp. Programmed controller for ultrasonic testing. 4,229,796, Cl. 364-507.000.

Garrison, Stephen N., to Dresser Industries, Inc. Lubrication connector for roller conveyors. 4,228,889, Cl. 198-501.000.

Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, to Bayerische Motoren Werke Aktiengesellschaft. Intake-pipe arrangement for in-line internal combustion engines. 4,228,769, Cl. 123-52.00M.

Gatrun Anstalt: *See—*
Corbic, Yves J., 4,228,633, Cl. 53-412.000.

Gaudelli, Edmond N.; and Shepler, Edward E. Apparatus for producing molded concrete products. 4,228,985, Cl. 249-93.000.

Gaudiano, Anthony V.: *See—*
Wallace, Kenneth W.; and Gaudiano, Anthony V., 4,229,120, Cl. 405-158.000.

Gebr. Class Maschinenfabrik GmbH, Firma: *See—*
Homburg, Helmut, 4,228,636, Cl. 56-10.200.

Gebruder Lodige Maschinenbau GmbH of Elsener Str.: *See—*
Lucke, Roland, 4,229,110, Cl. 366-343.000.

Gebruder Loepfe AG: *See—*
Loepfe, Erich; and Weidmann, Erich, 4,228,828, Cl. 139-370.200.

Gebrueder Buehler AG: *See—*
Muller, Roman, 4,229,486, Cl. 426-483.000.

Gee, Thomas A., to Eaton Corporation. Pulse control of an electro magnetically actuated viscous fluid coupling. 4,228,880, Cl. 192-58.00B.

Geffe, Bruce T. Hollow rectangular joist. 4,228,631, Cl. 52-690.000.

Gefter, Evgeny L.: *See—*
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N., 4,229,560, Cl. 528-4.000.

Gellatly, John S; and Richter, Fred T., to Western Electric Company, Inc. Apparatus for bonding a plastic case to a stub cable. 4,229,155, Cl. 425-114.000.

Gelnett, Leland E.: *See—*
Kruse, John M.; and Gelnett, Leland E., 4,228,819, Cl. 137-489.000.

General Electric Company: *See—*
Arya, Satya P.; Grossman, Leonard N.; and Schoenig, Frederick C., Jr., 4,229,654, Cl. 250-358.00R.
Keramati, Bahram; and Kadambi, Vedanth, 4,228,959, Cl. 239-451.000.
Merrill, Richard C.; and Conners, Richard G., 4,229,777, Cl. 361-314.000.
Mullersman, Ferdinand H.; and Stillwell, Billy E., 4,229,686, Cl. 320-2.000.
Noesen, Stanley J.; and Baldwin, Fredrick M., 4,228,583, Cl. 29-747.000.
Salem, Robert J., 4,229,811, Cl. 367-93.000.
Tuller, Clarence J., 4,229,785, Cl. 362-433.000.

General Motors Corporation: *See—*
Bakonyi, Stephen M., 4,228,772, Cl. 123-403.000.
Barnard, James A., 4,228,573, Cl. 29-157.30R.
Hooper, Robert E.; and Johnson, Lawrence P., 4,228,915, Cl. 220-288.000.
Matter, Robert C., 4,228,580, Cl. 29-527.700.
Perry, James C., 4,228,958, Cl. 239-411.000.
Schweikert, John F., 4,228,775, Cl. 123-440.000.
Sperry, Kenneth D., 4,228,653, Cl. 60-272.000.
Templin, Jackson R., 4,228,684, Cl. 73-362.0SC.

General Signal Corporation: *See—*
Sibley, Henry C., 4,229,663, Cl. 307-9.000.

Genuit, Luther L. Storage and dispensing apparatus for swimming pool vacuum hose. 4,228,553, Cl. 4-490.000.

George, Clifford L.: *See—*
Hamlin, Thomas J.; and George, Clifford L., 4,229,101, Cl. 355-77.000.

Geria, Navin, to Bristol-Myers Company. Antiperspirant stick composition. 4,229,432, Cl. 424-68.000.

Ghislain, Andre: *See—*
Coppin, Roland; and Ghislain, Andre, 4,229,117, Cl. 403-370.000.

Giallorenzi, Thomas G.: *See—*
Villarruel, Carl A.; and Giallorenzi, Thomas G., 4,229,402, Cl. 264-262.000.

Gilbert, Charles H. Mixture metering machine. 4,228,924, Cl. 222-63.000.

Gilhooley, Robert. Vehicle speed alarm. 4,229,727, Cl. 340-53.000.

Gill, Michael L., to Beloit Corporation. Extended nip press with bias ply reinforced belt. 4,229,254, Cl. 162-358.000.

Gillespie, Ronald G.: *See—*
Pitts, Robert W., Jr.; and Gillespie, Ronald G., 4,229,769, Cl. 358-285.000.

Gillilan, Edward L. Programmable switch. 4,229,633, Cl. 200-159.00B.

Gilliland, Maxwell C.; Smith, Burton J.; and Ferguson, Gary L., to Denelcor, Inc. Concurrent task and instruction processor and method. 4,229,790, Cl. 364-200.000.

Gislen, Lars O. S.: *See—*
Olsson, Kjell I.; Aberg, Anders E. B.; and Gislen, Lars O. S., 4,228,677, Cl. 73-64.400.

Glitza, Horst W.: *See—*
Wesche, Karlhans; Schubert, Peter H.; and Glitza, Horst W., 4,229,393, Cl. 264-42.000.

Glover, Leon C.; and Lopez, Eugene F., to Raychem Corporation. Method for coating a polymeric article with a thermochromic paint. 4,228,761, Cl. 116-201.000.

Gnehm, Rene: *See—*
Granwehr, Bernhard; and Gnehm, Rene, 4,229,367, Cl. 260-465.00R.

Goddijn, Bernardus H. A., to U.S. Philips Corporation. Electronically commutating motor. 4,229,682, Cl. 318-254.000.

Goegelman, Robert T.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,229,534, Cl. 435-119.000.

Gold, Nicholas: *See—*
Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., 4,229,090, Cl. 354-86.000.

Gonnello, Lawrence J. Ice fishing device. 4,228,609, Cl. 43-16.000.

Gonser, Donald I., to Dentsply Research & Development Corp. Xenon light apparatus for supplying ultraviolet and visible spectra. 4,229,658, Cl. 250-504.00H.

Goodman, Donald: *See—*
Feldman, Martin L.; Goodman, Donald; Koral, Marvin; Miller, Robert S.; and Stanaback, Robert J., 4,229,569, Cl. 528-501.000.

Goodman, Jerome J.: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
Burkholder, Ward J.; Miller, Glenn E.; and Nagel, Fritz J., 4,229,596, Cl. 568-768.000.

Goransson, Jan. Rim for a mini-golfcourse. 4,229,007, Cl. 273-176.00B.

Gordon, Alan J., to Shandon Southern Products Limited. Dispensing viscous fluids. 4,228,926, Cl. 222-103.000.

Gordon Barlow Design: *See—*
Barlow, Gordon A.; Janiszewski, Anthony T.; and Krutsch, John R., 4,229,005, Cl. 273-86.00D.

Goshima, Takeshi: *See—*
Kawamura, Naoto; Iizuka, Kiyoshi; Tanaka, Nobuyoshi; Kuwayama, Tetsuro; Matsumoto, Kazuya; and Goshima, Takeshi, 4,229,750, Cl. 346-107.00R.
Tsuji, Takao; Goshima, Takeshi; and Sato, Hideaki, 4,229,763, Cl. 358-128.500.

Goto, Tadashi. Transparency cassette and viewer or projector. 4,229,084, Cl. 353-113.000.

Govier, John P.: *See—*
Harvey, A. Herbert; and Govier, John P., 4,228,853, Cl. 166-248.000.

Gozzi, Fausto: *See—*
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,229,355, Cl. 260-348.520.

Graeme, Jerald G., to Burr-Brown Research Corporation. Linear low drift bridge amplifier. 4,229,692, Cl. 324-62.000.

Graham, Robert G. Sail supports. 4,228,755, Cl. 114-111.000.

Granger, Steven T., to Thompson Marine Corporation. Gas diffuser, aerator, or sparger apparatus. 4,229,389, Cl. 261-122.000.

Granwehr, Bernhard; and Gnehm, Rene, to Siegfried Aktiengesellschaft. Preparation of trans-4-alkyl-cyanoarylcyclohexanes. 4,229,367, Cl. 260-465.00R.

Graphic Arts Manufacturing Company: *See—*
Childers, Warren, 4,229,107, Cl. 356-443.000.
Childers, Warren, 4,229,108, Cl. 356-443.000.

Grasser, Katalin: *See—*
Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, 4,229,350, Cl. 260-243.300.

Grather, Gunter: *See—*
Rabus, Friedrich; and Grather, Gunter, 4,228,778, Cl. 123-605.000.

Graunke, Donald R., to Boeing Company, The. Method for measuring the relative etching or stripping rate of a solution. 4,229,264, Cl. 204-1.00T.

Gray, Paul E., to Universal Sewer Pipe Company. Pipe coupler. 4,229,028, Cl. 285-235.000.

Gray, Russell H.; and Kuchta, August D., to Du Pont de Nemours, E. I., and Company. Photohardenable elements with a non-tacky matte finish. 4,229,518, Cl. 430-273.000.

Great Circle Associates: *See—*
Mullerheim, Steven B.; and Williams, Fred G., 4,229,202, Cl. 71-8.000.

Green, Stanley E., to Hycel, Inc. Tris (hydroxymethyl) aminomethane salt of 2-mercaptosuccinic acid. 4,229,369, Cl. 260-501.190.

Greene, Hugh W. Buried reed, extra-short pulse width pulser. 4,229,700, Cl. 328-65.000.

Greene, Tweed & Co., Inc.: *See—*
Burke, John A.; and Gross, James B., 4,229,013, Cl. 277-188.00R.

Greer, S. Thomas: *See—*
Franklin, Kenneth; Rosenthal, William S.; and Greer, S. Thomas, 4,228,893, Cl. 206-205.000.

Gregg, David W., to United States of America, Energy. Apparatus and method for solar coal gasification. 4,229,184, Cl. 48-62.00R.

Gregorian, Roubik; and Reddy, Kadiri R., to American Microsystems, Inc. Round off correction logic for modified Booth's algorithm. 4,229,800, Cl. 364-745.000.

Greif, Norbert: *See—*
Boerzel, Paul; Freyberg, Peter; Greif, Norbert; and Widder, Rudi, 4,229,174, Cl. 8-588.000.

Grenier, Maurice, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Heat exchangers. 4,228,660, Cl. 62-79.000.

Griffiths, John B. Printing apparatus. 4,228,736, Cl. 101-382.0MV.

Grimm, Richard C.: *See—*
Reed, Denvil E.; and Grimm, Richard C., 4,229,262, Cl. 203-29.000.

Groenebaum, Theo; and Kuper, Hans-Heinrich, to Heinrich Kuper, Firma. Apparatus for folding over and pressing into position the edge strips of two material webs. 4,228,603, Cl. 38-1.00B.

Gross, Charles, to Vending Components, Inc. Stand for holding a beer keg in position for gravity feed. 4,228,929, Cl. 222-185.000.

Gross, Glenn, to Norlin Industries, Inc. Programmable current source for filter or oscillator. 4,228,713, Cl. 84-1.190.

Gross, James B.: *See—*
Burke, John A.; and Gross, James B., 4,229,013, Cl. 277-188.00R.

Grossman, Leonard N.: *See—*
Arya, Satya P.; Grossman, Leonard N.; and Schoenig, Frederick C., Jr., 4,229,654, Cl. 250-358.00R.

Groth, Edward J., Jr., to Motorola, Inc. Two-way communications system and method of synchronizing. 4,229,741, Cl. 370-24.000.

Groves, E. Stuart. Ski boot attachment. 4,228,602, Cl. 36-132.000.

Gruber, Wolfgang: *See—*
Ziegenhorn, Joachim; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; and Bergmeyer, Hans U., 4,229,527, Cl. 435-11.000.

Grumman Energy Systems, Inc.: *See—*
Wadkinson, George W., Jr., 4,228,848, Cl. 165-11.00R.

Grundell, Carl-Erik. Filing folder for perforated papers. 4,229,022, Cl. 281-45.000.

Grunwald, Peter H. Apparatus for wireless transmission of a teaching program in a classroom. 4,229,829, Cl. 455-600.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Tiedt, Larry M., 4,229,665, Cl. 307-150.000.
GTE Laboratories Incorporated: *See*—
McCollum, Bill C.; and Lempicki, Alexander, 4,229,713, Cl. 331-94.50F.
GTE Products Corporation: *See*—
Bouchard, Andre C.; and Fraley, Lawrence R., 4,229,161, Cl. 431-362.000.
Milburn, Zachariah H., Jr., 4,229,666, Cl. 307-290.000.
Plumb, John L., 4,229,681, Cl. 315-244.000.
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Wu, Ching-Yong; and Kobylinski, Thaddeus P., 4,229,601, Cl. 568-860.000.
Gulla, Michael; and Hartnett, Barry J., to Shipley Company Inc. Self-monitoring electroless plating solution. 4,229,218, Cl. 106-1.230.
Gum, Clarence R.; and Kister, Albert T., to Shell Oil Company. Process for recovery of ethylene oligomers. 4,229,607, Cl. 585-520.000.
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Braun, Siegfried V., 4,229,613, Cl. 174-47.000.
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Gurries, Raymond A., 4,229,046, Cl. 299-37.000.
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Foscante, Raymond E.; Gysegem, Albert P.; and Martinich, Pamela J., 4,229,563, Cl. 528-99.000.
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Haagensen, Darrow E., Jr., to Duke University, Inc. Breast cyst fluid protein assay. 4,229,426, Cl. 424-1.000.
Haase, Elmer A., to Bendix Corporation, The. Fuel control. 4,228,777, Cl. 123-454.000.
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Haben, Dale E.; Kepley, Garry D.; and Vander Molen, Gordon L., to Bell Telephone Laboratories, Incorporated. Switching network control arrangement. 4,229,624, Cl. 179-18.00E.
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, to Ciba-Geigy Corporation. Anthranilates of oxyalkylated cyanuric acid. 4,229,576, Cl. 544-222.000.
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Shepard, Kenneth L.; and Halczenko, Wasyl, 4,229,455, Cl. 424-256.000.
Hall, Lewis W., Jr.; Kerr, David L.; Hollstein, Elmer J.; Myers, Harry K., Jr.; and Schneider, Abraham, to Suntech, Inc. Decolorization of norbornadiene dimers. 4,229,612, Cl. 585-823.000.
Hall, Wilbur S.: *See*—
Leister, Harry M.; Donovan, Joseph C.; and Hall, Wilbur S., 4,229,492, Cl. 427-345.000.
Hamada, Hiroyuki: *See*—
Suzuki, Hajime; Hamada, Hiroyuki; and Ichikawa, Rinjiro, 4,229,498, Cl. 428-212.000.
Hamlin, Thomas J.; and George, Clifford L., to Xerox Corporation. Duplex/simplex precollation copying system. 4,229,101, Cl. 355-77.000.
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Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,229,444, Cl. 424-200.000.
Hammes, Theo, to Mauser-Kommandit Gesellschaft. Roller chimes for closed head drums. 4,228,911, Cl. 220-1.00R.
Hance, Richard J., to Leeds & Northrup Company. Expendable immersion thermocouple. 4,229,230, Cl. 136-234.000.
Hancox, Elwyn J. Drum tuning mechanism. 4,228,721, Cl. 84-411.00R.
Hanlon, Terrance W.: *See*—
Vetter, Ottomar H.; and Hanlon, Terrance W., 4,229,064, Cl. 339-186.00M.
Hansen, David R.; and Himes, Glenn R., to Shell Oil Company. Suede-look shoe soles. 4,229,338, Cl. 260-33.6AQ.
Hansen, Ove E.: *See*—
Felsvang, Karsten S.; and Hansen, Ove E., 4,229,249, Cl. 159-4.00B.
Hansen, Thomas A.; Johnson, Claude, Jr.; and Wilbarg, Robert R., to International Business Machines Corporation. Method for fabricating non-reflective semiconductor surfaces by anisotropic reactive ion etching. 4,229,233, Cl. 148-1.500.
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Swan, Jack C., Jr., 4,229,546, Cl. 521-55.000.
Hanson, William. Adjustable idler roll. 4,228,891, Cl. 198-827.000.
Harada, Yusuke: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Haraikawa, Tetsuo; and Hasaka, Tomio, to Tokico Ltd. Mechanical disc brake. 4,228,875, Cl. 188-72.700.
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Ashburner, Adi K., 4,228,992, Cl. 270-59.000.
Harrington, Alan L., to TRW Inc. Breakage resistant V-grooved <100> silicon substrates. 4,229,474, Cl. 428-162.000.
Harris, Clifford E.; and Spary, Norman B., to EPS (Research and Development) Limited. Container. 4,228,912, Cl. 220-4.00R.
Harris, William B.: *See*—
Davison, Richard R.; Harris, William B.; and Maldonado, Salomon, 4,228,790, Cl. 126-444.000.
Harrow, George A., to Westlane Industries, Inc. Machines for tapping nuts. 4,229,126, Cl. 408-63.000.
Hart, Thomas E. Folding track removing implement. 4,228,861, Cl. 172-662.000.
Hartmann, Achim: *See*—
Cole, Donald G.; Hartmann, Achim; Kulling, Achim M.; and Trub, Hermann B., 4,229,399, Cl. 264-117.000.
Hartnett, Barry J.: *See*—
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Hartog, Martin: *See*—
Shelley, Julian H.; Clamp, John R.; and Hartog, Martin, 4,229,477, Cl. 424-330.000.
Hartstein, Allan M.; and Petersen, Kurt E., to International Business Machines Corporation. Micromechanical display logic and array. 4,229,732, Cl. 340-378.200.
Harvey, A. Herbert; and Govier, John P. Petroleum production method. 4,228,853, Cl. 166-248.000.
Harvey Hubbell, Incorporated: *See*—
Jaconette, Frank C., 4,229,065, Cl. 339-258.00T.
Harvey, Richard G., to Dunlop Limited. Method and apparatus for the continuous production of a block of reconstituted foam material. 4,229,398, Cl. 264-113.000.
Harwood, Edward D.: *See*—
Heidecker, Robert F.; and Harwood, Edward D., 4,228,763, Cl. 119-14.080.
Harwood, Leopold A.; and Wittmann, Erwin J., to RCA Corporation. Signal detector including sample and hold circuit with reduced offset error. 4,229,759, Cl. 358-19.000.
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Haraikawa, Tetsuo; and Hasaka, Tomio, 4,228,875, Cl. 188-72.700.
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Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, 4,228,825, Cl. 138-120.000.
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Usami, Seiji; Oota, Masanori; Takita, Hitoshi; and Hashizume, Hideyuki, 4,229,549, Cl. 525-76.000.
Haskell, Donald M.: *See*—
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Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kitada, Hisashi, 4,229,558, Cl. 526-125.000.
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Hatcher, Charles S.; and Smith, Kenneth E., to Phillips Petroleum Company. Method for drawing yarn. 4,229,404, Cl. 264-290.500.

Hattori, Tadashi. Sprinkler head having a plurality of supporting legs. 4,228,859, Cl. 169-57.000.

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Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, 4,229,440, Cl. 424-180.000.

Haug, Edward W., to Barber-Colman Company. Tramming fixture for positioning a dressing wheel. 4,228,781, Cl. 125-11.0CD.

Haug, Theobald: *See*—
Kiefer, Jurg; and Haug, Theobald, 4,229,351, Cl. 260-326.260.

Hawker Siddeley Bracket Limited: *See*—
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Hawkins, Curtis O.: *See*—
Chaban, Castulo, Jr.; and Hawkins, Curtis O., 4,229,154, Cl. 425-72.00S.

Hawkins, Royal R.; and Kuntz, Leland E., to Honeywell Inc. Photo electrically programmed steering control. 4,229,649, Cl. 250-215.000.

Hay, William D.: *See*—
Weinstock, Jacques; Lieber, Derek; and Hay, William D., 4,229,652, Cl. 250-308.000.

Hayashi, Teruyuki: *See*—
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,229,381, Cl. 568-454.000.

Hayashi, Yasuro: *See*—
Namiki, Ryoichi; and Hayashi, Yasuro, 4,229,644, Cl. 219-469.000.

Haynes, Robert W.; and Rasmussen, William H., to Payfer Laboratories Inc. Living organism packaging. 4,229,544, Cl. 435-253.000.

Hazen Research, Inc.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,229,209, Cl. 75-1.00R.

Healy, Lawrence G., to Westinghouse Electric Corp. Optical viewing port assembly for a miniature inspection TV camera. 4,229,762, Cl. 358-100.000.

Heath, James E., to Samuel Strapping Systems Limited. Process and apparatus for heat treating steel using infrared radiation. 4,229,236, Cl. 148-128.000.

Heck, Gunter; Roscher, Gunter; and Donth, Rudolf, to Hoechst Aktiengesellschaft. Process for separating water from organic multiple component mixtures by distillation. 4,229,261, C... 203-14.000.

Heckles, John S., to Armstrong Cork Company. Acrylate-ureadiacetoacetamide-diacetoacetamide copolymers. 4,229,505, Cl. 428-474.400.

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Frankenfield, Fred I., 4,228,786, Cl. 126-427.000.

Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica N.V. Heterocyclic derivatives of 1-(1,3-dioxolan-2-ylmethyl)-1H-1,2,4-triazoles having antifungal and antibacterial properties. 4,229,460, Cl. 424-269.000.

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Heidecker, Robert F.; and Harwood, Edward D., to Dairy Systems, Inc. Milking unit support and detacher mechanism. 4,228,763, Cl. 119-14.080.

Heidel, Bernd: *See*—
Heinz, Richard; and Heidel, Bernd, 4,229,771, Cl. 360-46.000.

Heijnemans, Werner A. L.; Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., to U.S. Philips Corporation. Deflection unit for a color television display tube. 4,229,720, Cl. 335-213.000.

Heijnen, Andreas T.: *See*—
Breuers, Theo P. C.; Heijnen, Andreas T.; and van Soest, Hendrikus J. J., 4,228,995, Cl. 271-292.000.

Heilman, Robert R.: *See*—
Gale, Leo R.; and Heilman, Robert R., 4,228,672, Cl. 72-130.000.

Heim, Richard; Hermanns, Peter; and Tschentscher, Alfred, to FMN Schuster GmbH & Co. KG. Assembly for winding yarns and the like on a bobbin. 4,228,965, Cl. 242-45.000.

Heimbigner, Gary L.; and Booher, Robert K., to Rockwell International Corporation. Voltage boosting substrate bias generator. 4,229,667, Cl. 307-297.000.

Hein, Wolfgang; and Cosack, Klaus, to Carl Schleicher & Schull GmbH & Co. KG. Housing for single-use filter units. 4,229,306, Cl. 210-446.000.

Heiney, Elmer T., III; and Merchant, Stanley R., to Ford Motor Company. Exhaust gas sensor electrical circuit improvement. 4,228,675, Cl. 73-23.000.

Heinola, Reino, to Valmet Oy. Apparatus for controlling relative gas flow rates through ducts. 4,228,849, Cl. 165-39.000.

Heinrich, Hans J.; Oelbermann, Max; and Rademacher, Karl A. Filter press with cleansing spray device. 4,229,303, Cl. 210-225.000.

Heinrich Kuper, Firma: *See*—
Groenebaum, Theo; and Kuper, Hans-Heinrich, 4,228,603, Cl. 38-1.00B.

Heinz, Richard; and Heidel, Bernd, to Robert Bosch GmbH. Method of recording a control signal adjacent another signal track on a magnetic recording medium, and system therefor. 4,229,771, Cl. 360-46.000.

Heinzel, Fritz: *See*—
Benes, Ivan; Muller-Duysing, Wolfgang; and Heinzel, Fritz, 4,229,300, Cl. 210-96.100.

Heinzmann, Erich. Inclined retaining wall and element therefor. 4,229,123, Cl. 405-273.000.

Heisner, Marvin M., to Fansteel Inc. Tool holding device. 4,228,705, Cl. 82-36.00R.

Heisner, Marvin M., to Fansteel Inc. Reinsertable adjustable boring bar. 4,229,128, Cl. 408-185.000.

Heldwein, Carl A.; Jekel, Richard N.; Sampson, Stephen R.; and Zupan, John T., to Cubic Western Data. Ranging system and method for determining the range of a vehicle from a plurality of reference points. 4,229,737, Cl. 343-6.00R.

Helminiak, Thaddeus E.: *See*—
Evers, Robert C.; Arnold, Fred E.; and Helminiak, Thaddeus E., 4,229,566, Cl. 528-185.000.

Hengl, Helmut: *See*—
Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, 4,228,769, Cl. 123-52.00M.

Henkel Corporation: *See*—
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Rogier, Edgar R., 4,229,562, Cl. 528-85.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Scharf, Rolf; Schlussler, Hans-Joachim; and Staschkiewicz, Friedrich, 4,229,409, Cl. 422-13.000.

Henrick, Clive A., to Zoecon Corporation. Benzylpyrrolylmethyl esters of cyclopropane carboxylic acids. 4,229,352, Cl. 260-326.430.

Henrick, Clive A.: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,229,368, Cl. 260-465.00D.

Henry, Paul S., to Bell Telephone Laboratories, Incorporated. Precision phase modulators utilizing cascaded amplitude modulators. 4,229,715, Cl. 332-18.000.

Henschke, Robert W.: *See*—
Wayne, Robert J.; and Henschke, Robert W., 4,229,079, Cl. 350-356.000.

Hermanns, Peter: *See*—
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Hernandez, Sebastian: *See*—
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,229,534, Cl. 435-119.000.

Herpin, Ivey. Saw tooth cutting apparatus. 4,228,701, Cl. 76-29.000.

Herriott, Leslie V., to Lowe and Fletcher Limited. Magnetically acting lock and key. 4,228,667, Cl. 70-276.000.

Herschmann, Otto; Zernig, Norbert; Holthausen, Dieter; Stock, Hugo; and Tholen, Paul, to Klockner-Humboldt-Deutz Aktiengesellschaft. Internal combustion engine and a method of operation thereof. 4,228,655, Cl. 60-602.000.

Hertz, Walter; Stroh, Jan; and Schwalme, Heinz, to Siemens Aktiengesellschaft. Compress gas circuit breaker. 4,229,632, Cl. 200-148.00A.

Herwig, Warren E., to Allis-Chalmers Corporation. Method and apparatus for measuring area traversed by vehicular implement. 4,229,799, Cl. 364-564.000.

Hess, Peter: *See*—
Rampel, Hans; Hess, Peter; and Schulz, Volkmar, 4,228,981, Cl. 248-430.000.

Hessel, Dagny B.: *See*—
Blomback, Birger E. G.; and Hessel, Dagny B., 4,229,435, Cl. 424-101.000.

Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., to Teledyne Industries, Inc. Insulated switch arrangement for electric motor. 4,229,634, Cl. 200-302.000.

Higashi, Kazo; Nakanishi, Sadayuki; and Fukunaga, Akio, to Kobe Steel, Limited. Valve. 4,228,988, Cl. 251-327.000.

Higashide, Eiji; Hatano, Kazunori; and Asai, Mitsuko, to Takeca Chemical Industries, Ltd. Method for producing antibiotic C-15003 P-4. 4,229,533, Cl. 435-119.000.

Hight, Henry D., Jr. Apparatus for use in slip forming structural concrete members. 4,229,153, Cl. 425-64.000.

Higuchi, Yoshinori: *See*—
Sakurai, Hajime; and Higuchi, Yoshinori, 4,229,642, Cl. 219-125.100.

Hill, Craig C. Heat recuperative engine with improved recuperator. 4,228,654, Cl. 60-508.000.

Hill, Norman A.: *See*—
Hunt, Robert J.; and Hill, Norman A., 4,228,639, Cl. 57-16.000.

Himes, Glenn R.: *See*—
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Hino, Tadahiro: *See*—
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Hinz, Paul: *See*—
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Hipp, Jan. Apparatus for determining off-aim during firing simulation. 4,229,103, Cl. 356-141.000.

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Hirata, Tetsuyuki, to United States of America, Army. Pressure relief manometer. 4,228,689, Cl. 73-747.000.

Hirayama, Tatsuyuki: *See*—
Takemoto, Yoshinori; Yasui, Toshihiro; Fujii, Kyoichi; Tanaka, Hiroshi; and Hirayama, Tatsuyuki, 4,229,446, Cl. 424-230.000.

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Hirose, Takao: *See*—
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Hirota, Shinichiro, to Hoya Corporation. Edge-coating glass for laser disks. 4,229,220, Cl. 106-47.00R.
Hisaka Works, Ltd.: *See*—
Sumitomo, Hiroyuki, 4,228,850, Cl. 165-110.000.
Hitachi Chemical Company, Ltd.: *See*—
Konii, Susumu; Yoshimura, Yukio; Nanaumi, Ken; Yasuzawa, Kohei; Yoshida, Takeshi; and Shinko, Toyotaro, 4,229,330, Cl. 260-19.00R.
Hitachi Koki Company Limited: *See*—
Monma, Hisayoshi; Katagiri, Shigenobu; and Kozawa, Hiroomi, 4,228,938, Cl. 226-9.000.
Hitachi, Ltd.: *See*—
Arakawa, Hideo; Namekawa, Takashi; Kuniya, Keiichi; and Sugawara, Hiroyuki, 4,229,631, Cl. 200-144.00B.
Karino, Kimiji; Nagano, Masami; and Momono, Masakichi, 4,229,384, Cl. 261-39.00D.
Matsuda, Noriaki; and Enomoto, Kunio, 4,229,235, Cl. 148-127.000.
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Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.
Takeda, Renzo; Uchikawa, Sadao; Kurihara, Kunitoshi; Yamamoto, Masaaki; Yokomi, Michiro; Yamashita, Junichi; and Takamatsu, Jun, 4,229,258, Cl. 176-76.000.
Hitachi Shipbuilding & Engineering Company Limited: *See*—
Ito, Takusen; Murakami, Masami; Ishikawa, Eizo; and Otsuka, Keiichi, 4,229,157, Cl. 431-90.000.
Hitora, Shozo, to Sasaki Electric Manufac. Co. Ltd. Beam-rotary lamp. 4,229,781, Cl. 362-274.000.
Hobart Corporation: *See*—
Churley, George; and Fraula, Louis F., 4,229,229, Cl. 134-18.000.
Hocker, Harvey L.; and Alcamo, John M., to Northwest Sanitation Products, Inc. Bottle with a clip for suspending the bottle in inverted position. 4,228,928, Cl. 222-181.000.
Hodge, Malcolm H.; and Dunn, William M., to TRW Inc. Fiber optic relay switch. 4,229,068, Cl. 350-96.200.
Hodgins, Leonard T.; Finlay, Thomas H.; and Johnson, Alan J., to New York University. Preparation of trichloro-s-triazine activated supports for coupling ligands. 4,229,537, Cl. 435-177.000.
Hoechst Aktiengesellschaft: *See*—
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Mayer, Norbert; Pfahler, Gerhard; Scheidl, Franz; and Wiezer, Hartmut, 4,229,382, Cl. 260-930.000.
Meininger, Fritz, 4,229,171, Cl. 8-661.000.
Savitz, Steven R.; and Drago, James A., 4,229,299, Cl. 210-85.000.
Spietschka, Ernst; and Urban, Manfred, 4,229,583, Cl. 549-52.000.
Usbeck, Gerhard, 4,229,266, Cl. 204-33.000.
Walch, Axel; Wildhardt, Jurgen; and Beissel, Dieter, 4,229,291, Cl. 210-23.00F.
Hoet, Roger, to Thomson-CSF. Grid of pyrolytic graphite for a high-power electron tube and a method for the assembly of said grid. 4,229,674, Cl. 313-348.000.
Hoffman, Jacob M., Jr.: *See*—
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,229,456, Cl. 424-256.000.
Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Pesticidal O-alkyl-O-(1,5-disubstituted-1,2,4-triazolyl-(3)-thiono-phosphoric (phosphonic) acid esters and ester-amides. 4,229,444, Cl. 424-200.000.
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Hogan, Lawrence R., to Cole-Parmer Instrument Company. Dispensing pump. 4,228,930, Cl. 222-212.000.
Holasek, Edward; and Jennings, Wayne D., to Case Western Reserve University. Diagnostic ultrasonography utilizing frequency spectrum analysis presented in terms of B-scan color patterns or X-Y graph displays. 4,228,804, Cl. 128-660.000.
Hollandse Signaalapparaten B.V.: *See*—
Nijhuis, Jan; and Terwee, Thomas H. M., 4,228,643, Cl. 57-297.000.
Hollis, Alberta M., to International Paper Company. Method and apparatus for removing gussets from flat tubes. 4,228,728, Cl. 93-84.0TW.
Holloway, Jack W., to United States of America, Navy. Apparatus for securing a ferroelectric stack to a weighted projection surface. 4,229,812, Cl. 367-158.000.
Hollstein, Elmer J.: *See*—
Hall, Lewis W., Jr.; Kerr, David L.; Hollstein, Elmer J.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,229,612, Cl. 585-823.000.
Holm, Boris: *See*—
Bengtsson, Erik; and Holm, Boris, 4,229,595, Cl. 568-706.000.
Holmes, William F.: *See*—
Mead, Claude F.; and Holmes, William F., 4,229,661, Cl. 290-44.000.
Holt, Donald A.: *See*—
Richey, Clarence B.; Parsons, Samuel D.; Lechtenberg, Victor L.; and Holt, Donald A., 4,228,637, Cl. 56-341.000.
Holt, John B.; and Ibbotson, Arthur, to Imperial Chemical Industries Limited. Liquid diphenylmethane diisocyanate compositions. 4,229,347, Cl. 260-239.00A.
Holthausen, Dieter: *See*—
Herschmann, Otto; Zernig, Norbert; Holthausen, Dieter; Stock, Hugo; and Tholen, Paul, 4,228,655, Cl. 60-602.000.
Holzmann, Dieter, to ITT Industries, Inc. Monolithic integrated organ gate circuit. 4,229,731, Cl. 340-365.00E.
Homburg, Helmut, to Gebr. Class Maschinenfabrik GmbH, Firma. Method and apparatus for the measurement of plant density for the control of harvest machines. 4,228,636, Cl. 56-10.200.
Homeyer, Bernhard: *See*—
Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,229,444, Cl. 424-200.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Nashimoto, Ryo, 4,229,662, Cl. 307-9.000.
Okada, Motohiro, 4,228,840, Cl. 152-400.000.
Honeywell Inc.: *See*—
Bowman, George A., 4,229,827, Cl. 455-87.000.
Hawkins, Royal R.; and Kuntz, Leland E., 4,229,649, Cl. 250-215.000.
Jensen, Earl D.; and Marshall, George D., 4,229,792, Cl. 364-200.000.
Schultz, Richard M., 4,229,734, Cl. 340-512.000.
Honeywell Information Systems Inc.: *See*—
Irick, Dan F.; and Zollinger, Roger F., 4,229,693, Cl. 324-73.0PC.
Hooker Chemicals & Plastics Corp.: *See*—
Lowe, Edward J.; and Ridgway, Frederick A., 4,229,307, Cl. 250-543.000.
Tang, David Y.; and Foster, Arthur M., 4,229,378, Cl. 568-313.000.
Hooper, Robert E.; and Johnson, Lawrence P., to General Motors Corporation. Fuel cap with antirotation feature between cover and skirt portions. 4,228,915, Cl. 220-288.000.
Horiuchi, Kunihiro: *See*—
Kai, Tamotsu; Tsurumi, Michio; Sakakiyama, Takashi; and Horiuchi, Kunihiro, 4,229,507, Cl. 428-541.000.
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Ichikawa, Atsushi; Tomita, Kenkichi; Horiuchi, Taku; Suzuki, Shin-ichi; and Sakuma, Akira, 4,229,471, Cl. 424-320.000.
Horn, Richard E., to Pitt Metals & Chemicals, Inc. Process for electrodialytically controlling the alkali metal ions in a metal plating process. 4,229,280, Cl. 204-301.000.
Horton, Lloyd E., Jr. Grade checker. 4,228,588, Cl. 33-1.00H.
Horvath, Steve. Hydraulic sewer cleaning system. 4,228,990, Cl. 254-134.3FT.
Hospal Ltd.: *See*—
Fecondini, Luciano; and Bocchi, Andrea, 4,229,305, Cl. 210-321.00B.
Hotchkiss, Kenneth W. Cable connector cover. 4,229,616, Cl. 174-138.00F.
Houck, Robert J., to B. F. Goodrich Company, The. Rip detector signal detection circuit. 4,229,735, Cl. 340-676.000.
Housh, Lloyd M.; and Alder, William R., to Kaiser Aluminum & Chemical Corporation. Method of producing magnesium hydroxide. 4,229,423, Cl. 423-164.000.
Howe, Robert K., to Monsanto Company. Trifluoromethylphenyl isoxazolyl benzoates. 4,229,204, Cl. 71-88.000.
Howell, Russell B.; and Marrujo, Ralph G., to Fairchild Industries, Inc. Seat support structure. 4,229,040, Cl. 297-355.000.
Howell, Stephen L., to Kimball International, Inc. Multiplex chime generator. 4,228,714, Cl. 84-1.010.
Howse, Ronald N., to Vandervell Products Limited. Bearings. 4,229,057, Cl. 308-161.000.
Hoya Corporation: *See*—
Hirota, Shinichiro, 4,229,220, Cl. 106-47.00R.
Hren, John J.: *See*—
Degler, Howard E., Jr.; Clark, David E.; Hren, John J.; Jenkins, David A.; and Johnson, Paul F., III, 4,228,800, Cl. 128-303.140.
Hsu, Yun T. Bilateral swingable self-closing door hinge. 4,228,562, Cl. 16-154.000.
Huber, Lothar; and Reitz, Werner, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch unit. 4,228,882, Cl. 192-98.000.
Hudson, Colin M.: *See*—
Rabe, David L.; Hudson, Colin M.; and Soteropulos, Gust, 4,228,638, Cl. 56-341.000.
Hudson, Paul B.: *See*—
Mitscher, Lester A.; Clark, George W., III; and Hudson, Paul B., 4,229,592, Cl. 560-231.000.
Hufnagel, Robert A.: *See*—
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Hughes Aircraft Company: *See*—
Baird, Joseph M.; and Schwartz, Paul M., 4,229,828, Cl. 455-326.000.
Devendorf, Don C.; and Baskevitch, Eugene, 4,229,729, Cl. 340-347.0AD.
Leo, Bruno S., 4,228,657, Cl. 60-641.000.
Lotspeich, James F., 4,229,073, Cl. 350-150.000.
Manoly, Arthur E., 4,229,676, Cl. 315-3.500.
Hui, Peter W., to NCR Corporation. Method for recording multiple data segments on a storage disc with eccentricity factor. 4,229,808, Cl. 365-234.000.

Huignard, Jean-Pierre: *See*—
d'Auria, Luigi; and Huignard, Jean-Pierre, 4,229,071, Cl. 350-150.000.
Hulse, David O.: *See*—
Mekosh, George, Jr.; and Hulse, David O., 4,229,051, Cl. 303-99.000.
Hunt, Robert J.; and Hill, Norman A., to James Mackie & Sons Limited. Production of yarn. 4,228,639, Cl. 57-16.000.
Huntington, Robert C., to Motorola, Inc. Modified dual-slope analog to digital converter. 4,229,730, Cl. 340-347.0NT.
Hurst, George P. Cable tension roller. 4,229,138, Cl. 414-787.000.
Hutchins, Donald H., to Hutchins Manufacturing Company. Abrading tool with wear plate. 4,228,620, Cl. 51-170.0TL.
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Hutchins, Donald H., 4,228,620, Cl. 51-170.0TL.
Hutson, Thomas, Jr.; and Brinkmeyer, Francis M., to Phillips Petroleum Company. Process for dehydrogenating hydrocarbons. 4,229,609, Cl. 585-660.000.
Hwang, Ki-Sup, to Mead Corporation, The. Water based permanent jet printing ink and method of use. 4,229,747, Cl. 346-1.100.
Hycel, Inc.: *See*—
Green, Stanley E., 4,229,369, Cl. 260-501.190.
Lee, Lap Y., 4,229,179, Cl. 23-230.00R.
Hyman, Howard A.: *See*—
Mani, Siva A.; Hyman, Howard A.; and Daugherty, Jack D., 4,229,708, Cl. 331-94.50G.
Hynecek, Jaroslav, to Texas Instruments Incorporated. Virtual phase charge transfer device. 4,229,752, Cl. 357-24.000.
Hynek, Josef: *See*—
Klabacka, Bedrich; Polansky, Josef; and Hynek, Josef, 4,229,334, Cl. 260-28.50A.
Hyytinen, Niilo M., to ABC Concrete Products. Apparatus for making concrete brick having antique appearance. 4,229,156, Cl. 425-145.000.
I-Production Establishment: *See*—
Linford, James, 4,228,716, Cl. 84-1.180.
Ibbotson, Arthur: *See*—
Holt, John B.; and Ibbotson, Arthur, 4,229,347, Cl. 260-239.00A.
Ichikawa, Atsushi; Tomita, Kenkichi; Horiuchi, Taku; Suzuki, Shinichi; and Sakuma, Akira, to Lion Dentifrice Co., Ltd., The. N-(2-Ethylhexyl)-crotonamides. 4,229,471, Cl. 424-320.000.
Ichikawa, Rinjiro: *See*—
Suzuki, Hajime; Hamada, Hiroyuki; and Ichikawa, Rinjiro, 4,229,498, Cl. 428-212.000.
ICI Australia Limited: *See*—
Eppinger, Kurt H.; and Jackson, Mervyn B., 4,229,545, Cl. 521-38.000.
Idemura, Hideo: *See*—
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Ignatenko, Gennady F.: *See*—
Shushlebin, Boris A.; Lyakishev, Nikolai P.; Tregubenko, Viktor V.; Ignatenko, Gennady F.; and Subbotin, Nikolai I., 4,229,214, Cl. 75-133.000.
Ihara, Satoshi: *See*—
Ueda, Hirotada; and Ihara, Satoshi, 4,229,075, Cl. 350-269.000.
Ihara, Yasushi, to Shin Meiwa Industry Co., Ltd. Automatic welding apparatus. 4,229,641, Cl. 219-125.100.
Iizuka, Kiyoshi: *See*—
Kawamura, Naoto; Iizuka, Kiyoshi; Tanaka, Nobuyoshi; Kuwayama, Tetsuro; Matsumoto, Kazuya; and Goshima, Takeshi, 4,229,750, Cl. 346-107.00R.
Ikarashi, Takeo: *See*—
Sano, Kozo; Kiga, Hidetaka; and Ikarashi, Takeo, 4,229,373, Cl. 260-561.00R.
Ikari, Kouji, to Kyoto Ceramic Co., Ltd. Package for semiconductor devices with first and second metal layers on the substrate of said package. 4,229,758, Cl. 357-74.000.
Ikeda, Hitoshi: *See*—
Adachi, Teruhiko; and Ikeda, Hitoshi, 4,229,500, Cl. 428-373.000.
Ikeda, Toshihide; and Nakano, Motokiyo, to Shiseido Co., Ltd. Gel composition for nail enamel. 4,229,227, Cl. 106-181.000.
Ikeda, Yorifumi: *See*—
Mori, Shoichi; Ikeda, Yorifumi; and Nishikawa, Kikuo, 4,229,292, Cl. 210-673.000.
Ikesue, Haruyuki; and Yamamoto, Kazuo, to NSK-Warner K.K. Buckle assembly for seat belt. 4,228,567, Cl. 24-230.0AL.
Imada, Akira; Kitano, Kazuaki; and Asai, Mitsuko, to Takeda Chemical Industries, Ltd. Antibiotic G-6302. 4,229,436, Cl. 424-117.000.
Imahigashi, Naofumi: *See*—
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigashi, Naofumi, 4,229,495, Cl. 428-36.000.
Imazeki, Ryoji: *See*—
Kobayashi, Kengo; and Imazeki, Ryoji, 4,229,804, Cl. 364-900.000.
Imperial Chemical Industries Limited: *See*—
Bentley, John; Thompson, Morice W.; and Palluel, Auguste L. L., 4,229,339, Cl. 260-34.200.
Dawson, David G.; Osmond, Desmond W. J.; Skinner, Maurice W.; and West, Edmund J., 4,229,224, Cl. 106-90.000.
Holt, John B.; and Ibbotson, Arthur, 4,229,347, Cl. 260-239.00A.
Joy, David R., 4,229,313, Cl. 252-98.000.
Inamoto, Yoshiaki: *See*—
Aigami, Koji; Inamoto, Yoshiaki; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,229,375, Cl. 260-563.00P.
Takaishi, Naotake; Inamoto, Yoshiaki; and Matsukane, Masamoto, 4,229,324, Cl. 252-522.00R.
Inamura, Minoru; Takeuchi, Noboru; Inukai, Kazuhiro; Taninouchi, Kentaro; and Utsunomiya, Shin, to Mitsubishi Denki Kabushiki Kaisha. Method of bonding substrates made of metal or alloy. 4,228,944, Cl. 228-198.000.
Industrial Patterns & Molds, Inc.: *See*—
Jensen, Flemming E., 4,228,618, Cl. 51-125.500.
Industrial Pugliese, Inc.: *See*—
Pugliese, Antonio, 4,228,749, Cl. 112-274.000.
Ingram, James R., Jr.; and Kiesel, George A., to Recognition Equipment Inc. Dual belt drive. 4,228,953, Cl. 235-480.000.
Inmont Corporation: *See*—
Suskind, Stuart P.; and Sova, Stanley G., 4,229,472, Cl. 428-113.000.
Innocenti Santeustacchio S.p.A.: *See*—
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Inolex Corporation: *See*—
Johnsen, Vernon L.; and Stern, Elaine S., 4,229,429, Cl. 424-47.000.
Inoue, Mutsuhiro: *See*—
Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, 4,229,085, Cl. 353-75.000.
Inouye, Shigeharu: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
Insolio, Thomas A., to Fletcher-Terry Company, The. Self-castering glass cutter and compensating bi-directional head. 4,228,711, Cl. 83-881.000.
Institut Francais du Petrole: *See*—
Brulet, Daniel; and Chauvel, Bernard, 4,229,308, Cl. 252-47.000.
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,229,181, Cl. 23-230.0EP.
Institute of Gas Technology: *See*—
Victor, John G., 4,229,289, Cl. 209-474.000.
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Koloczek, Wiktor; Dobaj, Edward; and Zaremba, Tadeusz, 4,229,721, Cl. 336-133.000.
Intel Magnetics, Inc.: *See*—
Silverman, Peter J.; and Rose, Donald K., 4,229,248, Cl. 156-653.000.
International Business Machines Corporation: *See*—
Bergeron, David L.; and Stephens, Geoffrey B., 4,229,753, Cl. 357-28.000.
Chiu, George T.; Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,229,247, Cl. 156-643.000.
Fillmore, Gary L., 4,229,749, Cl. 346-75.000.
Hansen, Thomas A.; Johnson, Claude, Jr.; and Wilbarg, Robert R., 4,229,233, Cl. 148-1.500.
Hartstein, Allan M.; and Petersen, Kurt E., 4,229,732, Cl. 340-378.200.
Janssen, Donovan M.; Radman, Anton J., Jr.; and Seaward, William S., 4,229,774, Cl. 360-98.000.
Kryder, Mark H., 4,229,807, Cl. 365-12.000.
Matyas, Stephen M.; Meyer, Carl H. W.; and Tuckerman, Louis B., III, 4,229,818, Cl. 375-2.000.
Metz, Eric A., 4,229,219, Cl. 106-22.000.
Panissidi, Hugo A., 4,229,136, Cl. 414-673.000.
Schaefer, John O., 4,229,112, Cl. 400-196.100.
Smith, Gerald L., 4,229,669, Cl. 307-354.000.
Travis, Terence, 4,229,100, Cl. 355-77.000.
International Flavors & Fragrances Inc.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,229,599, Cl. 568-819.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,229,314, Cl. 252-174.110.
International Nickel Co., Inc., The: *See*—
Subramanian, Kohur N.; Bell, Malcolm C. E.; Thomas, John A.; and Nissen, Norman C., 4,229,270, Cl. 204-109.000.
International Paper Company: *See*—
Hollis, Alberta M., 4,228,728, Cl. 93-84.0TW.
International Rectifier Corporation: *See*—
Lidow, Derek, 4,228,806, Cl. 128-731.000.
International Telephone and Telegraph Corporation: *See*—
Bilson, Edward B.; and Brown, Alfred H., III, 4,229,779, Cl. 362-217.000.
Brinson, Thomas F., 4,229,048, Cl. 301-37.0SS.
Charlton, Gregory G., 4,229,746, Cl. 343-854.000.
Kruger, Bradford E., 4,229,745, Cl. 343-771.000.
Streng, DeWayne A., 4,229,197, Cl. 65-4.00B.
Wallace, Charles H.; and Moncure, Richard W., 4,228,685, Cl. 73-432.00R.
Interox Chemicals Limited: *See*—
Covington, James W.; and Whittemore, Robert G., 4,229,422, Cl. 423-20.000.
Intille, George M., to Monsanto Company. Selective adsorption process. 4,229,188, Cl. 55-16.000.
Inukai, Kazuhiro: *See*—
Inamura, Minoru; Takeuchi, Noboru; Inukai, Kazuhiro; Taninouchi, Kentaro; and Utsunomiya, Shin, 4,228,944, Cl. 228-198.000.
Ir. H.M.W. Croese Raadgevend: *See*—
Croese, Hendrik M. W., 4,228,966, Cl. 242-54.00R.

Irick, Dan F.; and Zollinger, Roger F., to Honeywell Information Systems Inc. Method and apparatus for capacitance testing printed circuit boards. 4,229,693, Cl. 324-73.0PC.

Isaac, Peter, to Canada, Atomic Energy of, Limited. Method and apparatus for positioning and ejecting fuel element bundles in and from a downstream end of a horizontally extending fuel channel. 4,229,255, Cl. 176-31.000.

Ishida, Torao: *See*—
Shibuya, Chisei; Itoh, Hirataka; Ishii, Kunihiko; Ishida, Torao; and Shibukawa, Mitsuru, 4,229,573, Cl. 544-21.000.

Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, to Kumiai Chemical Industry Co., Ltd. Method for preparing multhiomycin. 4,229,535, Cl. 435-128.000.

Ishihara, Heigo: *See*—
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.

Ishihara, Kenji: *See*—
Yamaguchi, Yukio; Ishihara, Kenji; and Yonekura, Kikuo, 4,229,341, Cl. 260-42.160.

Ishii, Kunihiko: *See*—
Shibuya, Chisei; Itoh, Hirataka; Ishii, Kunihiko; Ishida, Torao; and Shibukawa, Mitsuru, 4,229,573, Cl. 544-21.000.

Ishii, Osamu: *See*—
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigashi, Naofumi, 4,229,495, Cl. 428-36.000.

Ishikawa, Eizo: *See*—
Ito, Takusen; Murakami, Masami; Ishikawa, Eizo; and Otsuka, Keiichi, 4,229,157, Cl. 431-90.000.

Isizuka, Yutaka, to Diesel Kiki Co., Ltd. Swash plate compressor. 4,229,145, Cl. 417-269.000.

Issa, Sedika: *See*—
Roth, Hermann J.; Eger, Kurt; Issa, Sedika; and Jacobi, Haireddin, 4,229,453, Cl. 424-251.000.

Itatani, Hiroshi: *See*—
Nishimura, Kenji; Uchiumi, Shinichiro; Fujii, Kozo; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,229,589, Cl. 560-193.000.

Itaya, Nobushige: *See*—
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,229,469, Cl. 424-304.000.

Ito, Takamasa, to Sony Corporation. Method of recording on a magnetic tape which is attached to a card. 4,229,770, Cl. 360-15.000.

Ito, Takusen; Murakami, Masami; Ishikawa, Eizo; and Otsuka, Keiichi, to Hitachi Shipbuilding & Engineering Company Limited. System for controlling feed of waste gas to ground flare. 4,229,157, Cl. 431-90.000.

Ito, Yoichiro, to United States of America, Health, Education and Welfare. Horizontal flow-through coil planet centrifuge. 4,228,950, Cl. 233-25.000.

Ito, Yoshitaka: *See*—
Miyao, Kohei; Ito, Yoshitaka; and Wachi, Tsuneo, 4,229,468, Cl. 424-287.000.

Itoh, Hirataka: *See*—
Shibuya, Chisei; Itoh, Hirataka; Ishii, Kunihiko; Ishida, Torao; and Shibukawa, Mitsuru, 4,229,573, Cl. 544-21.000.

Itoh, Tsutomu, to Onoda Cement Co., Ltd. Electrostatic power painting head. 4,228,961, Cl. 239-698.000.

ITT Industries, Inc.: *See*—
Engert, Klaus, 4,229,050, Cl. 303-6.00C.
Holzmann, Dieter, 4,229,731, Cl. 340-365.00E.

Ivanov, Boris I.: *See*—
Motin, Jury D.; Reformatsky, Igor A.; Sinitsyn, Pavel R.; Ivanov, Nikolai M.; Malakhov, Igor K.; and Ivanov, Boris I., 4,229,069, Cl. 350-96 290.

Ivanov, Nikolai M.: *See*—
Motin, Jury D.; Reformatsky, Igor A.; Sinitsyn, Pavel R.; Ivanov, Nikolai M.; Malakhov, Igor K.; and Ivanov, Boris I., 4,229,069, Cl. 350-96.290.

Iversen, Arthur; and Magyar, John, to Pfizer Inc. X-ray orienting apparatus. 4,229,656, Cl. 250-447.000.

Iwaki, Akio: *See*—
Kurita, Yoshio; and Iwaki, Akio, 4,229,514, Cl. 430-195.000.

Iwashita, Tomonori: *See*—
Date, Nobuaki; Kozuki, Susumu; and Iwashita, Tomonori, 4,229,091, Cl. 354-173.000.

Iwata, Hiroshi, to West Electric Company, Ltd. Distance indicator for camera. 4,229,092, Cl. 354-198.000.

Iwata, Nobuo: *See*—
Suzuki, Takami; Iwata, Nobuo; and Tsunasawa, Masami, 4,228,577, Cl. 29-418.000.

Izari, Gerard, to Cegedur Societe de Transformation de l'Aluminum Pechiney. Spark erosion machining process. 4,229,636, Cl. 219-69.00M.

Izawa, Taketoshi: *See*—
Miyazaki, Wasei; Kaise, Hirotsugu; Nakano, Yoshimasa; Izawa, Taketoshi; Oshiro, Yasuo; and Shinohara, Masanao, 4,229,466, Cl. 424-279.000.

Jablonsky, Erich, to Zahnradfabrik Friedrichshafen, A.G. Steering gear for motor vehicles. 4,228,696, Cl. 74-499.000.

Jackson, Joseph F., to Thomas Broadbent & Sons Limited. Solid bowl scroll discharge decanter centrifuges. 4,228,949, Cl. 233-7.000.

Jackson, Mervyn B.: *See*—
Eppinger, Kurt H.; and Jackson, Mervyn B., 4,229,545, Cl. 521-38.000.

Jacob, Richard J.; and Waugh, Dale L., to Dayco Corporation. Endless power transmission belt and method of manufacture. 4,228,692, Cl. 474-251.000.

Jacobi, Haireddin: *See*—
Roth, Hermann J.; Eger, Kurt; Issa, Sedika; and Jacobi, Haireddin, 4,229,453, Cl. 424-251.000.

Jacobone, Donato, to Frypan S.p.A. Coatings for polyolefinic products and products covered by skid coatings. 4,229,327, Cl. 260-13.000.

Jacobsen, Ole A.: *See*—
Gunnergaard, Marius; and Jacobsen, Ole A., 4,228,892, Cl. 198-832.000.

Jaconette, Frank C., to Harvey Hubbell, Incorporated. Electrical contact with torsion bars. 4,229,065, Cl. 339-258.00T.

Jaggard, James F. R.: *See*—
Mueller-Tamm, Heinz; Jaggard, James F. R.; and Schick, Hans, 4,229,318, Cl. 252-429.00B.

Jahn, Walter, to Daimler-Benz Aktiengesellschaft. Reel for automatic safety belts for vehicles, especially motor vehicles. 4,228,968, Cl. 242-107.000.

Jai, Kenneth. Rotary piston. 4,228,725, Cl. 92-159.000.

Jakob, Helmut: *See*—
Eiselbrecher, Max; Guenther, Rolf; and Jakob, Helmut, 4,228,976, Cl. 244-123.000.

James Mackie & Sons Limited: *See*—
Hunt, Robert J.; and Hill, Norman A., 4,228,639, Cl. 57-16.000.

Jamesbury Corporation: *See*—
Aoki, Tadashi, 4,228,816, Cl. 137-72.000.

Jameson, Michael J. Board games for playing draughts and chess. 4,229,008, Cl. 273-261.000.

Janiszewski, Anthony T.: *See*—
Barlow, Gordon A.; Janiszewski, Anthony T.; and Krutsch, John R., 4,229,005, Cl. 273-86.00D.

Janssen, Donovan M.; Radman, Anton J., Jr.; and Seaward, William S., to International Business Machines Corporation. Self-adapting flow restrictors. 4,229,774, Cl. 360-98.000.

Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,229,460, Cl. 424-269.000.
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,229,581, Cl. 548-262.000.

Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Hour hand corrector for dual display timepiece. 4,228,648, Cl. 368-185.000.

Jekel, Richard N.: *See*—
Heldwein, Carl A.; Jekel, Richard N.; Sampson, Stephen R.; and Zupan, John T., 4,229,737, Cl. 343-6.00R.

JENAer Glaswerk Schott & Gen.: *See*—
Dislich, Helmut; Hinz, Paul; and Wolf, Gunther, 4,229,491, Cl. 427-160.000.

Jenkins, David A.: *See*—
Degler, Howard E., Jr.; Clark, David E.; Hren, John J.; Jenkins, David A.; and Johnson, Paul F., III, 4,228,800, Cl. 128-303.140.

Jenkins, Ronald, to North American Philips Corporation. Acid phthalate crystal. 4,229,499, Cl. 428-336.000.

Jennings, Wayne D.: *See*—
Holasek, Edward; and Jennings, Wayne D., 4,228,804, Cl. 128-660.000.

Jensen, Earl D.; and Marshall, George D., to Honeywell Inc. Bus allocation synchronization system. 4,229,792, Cl. 364-200.000.

Jensen, Flemming E., to Industrial Patterns & Molds, Inc. Rotary disc sander with tiltable work support table and sander dust collection unit. 4,228,618, Cl. 51-125.500.

Jerky Treats, Inc.: *See*—
Brown, Bruce W.; Copple, Virgil E.; and Wilson, Carroll K., 4,229,485, Cl. 426-305.000.

Johannes Heidenhain GmbH: *See*—
Burkhardt, Horst; Schwefel, Ernst; Baumgartner, Alfons; Mayer, Anton; and Rauth, Michael, 4,229,646, Cl. 235-92.0GC.

Johannsen, Donald O.: *See*—
Kass, John J.; and Johannsen, Donald O., 4,229,144, Cl. 417-222.000.

Johansen, Thomas R.: *See*—
Torok, Ernest J.; Fleming, David L.; and Johansen, Thomas R., 4,229,072, Cl. 350-151.000.

Johnsen, Vernon L.; and Stern, Elaine S., to Inolex Corporation. Process for preparing alcohol soluble condensates of abietic acid and a protein hydrolsate. 4,229,429, Cl. 424-47.000.

Johnson, Alan J.: *See*—
Hodgins, Leonard T.; Finlay, Thomas H.; and Johnson, Alan J., 4,229,537, Cl. 435-177.000.

Johnson, Carl E.; and Crouthamel, Carl E., to United States of America, Energy. Nuclear reactor fuel element. 4,229,260, Cl. 176-82.000.

Johnson, Charles L. Lumber spacer and stick layer. 4,229,133, Cl. 414-42.000.

Johnson, Claude, Jr.: *See*—
Hansen, Thomas A.; Johnson, Claude, Jr.; and Wilbarg, Robert R., 4,229,233, Cl. 148-1.500.

Johnson, Claude D.: *See*—
Lilly, Robert L.; Tummers, Gerardus L. J.; Johnson, Claude D.; and Davis, Roger D., 4,229,813, Cl. 368-89.000.

Johnson & Jorgensen (Plastics) Limited: *See*—
Burton, George W., 4,228,920, Cl. 221-265.000.

Johnson, Lawrence P.: *See*—
Hooper, Robert E.; and Johnson, Lawrence P., 4,228,915, Cl. 220-288.000.

Johnson, Paul F., III: *See*—
Degler, Howard E., Jr.; Clark, David E.; Hren, John J.; Jenkins, David A.; and Johnson, Paul F., III, 4,228,800, Cl. 128-303.140.

Johnson, Philip P.: *See*—
Dingler, Geoffrey L.; and Johnson, Philip P., 4,228,962, Cl. 241-46.00R.

Johnston Boiler Company: *See*—
Smith, Willard P.; Michaels, Harry J.; and Shedd, Robert W., 4,228,767, Cl. 122-4.00D.

Jones, Dennis L., to Kardex Systems, Inc. Adjustable rail mounting assembly. 4,228,906, Cl. 211-126.000.

Jones, Gordon H.; and Young, John, to Syntex (U.S.A.) Inc. Naphthaquinone anti-psoriatic agents. 4,229,478, Cl. 424-331.000.

Jones, John L., Jr.: *See*—
Coggin, Charles H., Jr.; and Jones, John L., Jr., 4,229,198, Cl. 65-11.00W.

Jones, Robert J.; Vaughan, Robert W.; Buyny, Robert A.; and O'Rell, Michael K., to TRW Inc. Flexibilized vinyl polybutadiene maleimide resins. 4,229,550, Cl. 525-282.000.

Jones, Terry L.; and Miller, Brian S., to United States of America, Army. Electro-mechanical image converter. 4,229,081, Cl. 350-361.000.

Jos. Schneider GmbH & Co., Optische Werke Kreuznach: *See*—
Baab, Albert; and Himmelsbach, Paul, 4,229,094, Cl. 354-286.000.

Josephs, Richard M., to Sperry Corporation. Consecutive bit bubble memory detector. 4,229,806, Cl. 365-8.000.

Jost, Heinz: *See*—
Wenzel, Franz; Schoedel, Ulrich; Jost, Heinz; and Pilz, Hans, 4,229,311, Cl. 252-50.000.

Joy, David R., to Imperial Chemical Industries Limited. Alkali metal hypochlorite bleaching and cleaning compositions thickened with branch chain amine oxides. 4,229,313, Cl. 252-98.000.

Joy Manufacturing Company: *See*—
Frey, G. Robert; Parrotto, Joseph; and Fontaine, Francis X., 4,229,124, Cl. 405-303.000.

Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Method of determining liquid flow in a conduit. 4,228,683, Cl. 73-204.000.

Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Measurement and control of multicomponent liquid systems. 4,228,815, Cl. 137-10.000.

Junge, Helmut; Kurtz, Walter; Dimroth, Peter; and Scherer, Hans, to BASF Aktiengesellschaft. Azo dyes from an oxadiazolyl-substituted aniline. 4,229,343, Cl. 260-156.000.

K. Ernst Brinkmann, Industrieverwaltung: *See*—
Brinkmann, Karl E.; and Assmann, Bernd L., 4,228,874, Cl. 188-72.100.

Kabelschlepp Gesellschaft mit beschrankter Haftung: *See*—
Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, 4,228,825, Cl. 138-120.000.

Kabushiki Kaisha Aoyama Seisakusho: *See*—
Kazino, Hiroshi, 4,228,722, Cl. 85-9.00R.

Kabushiki Kaisha Daini Seikosha: *See*—
Yajima, Kenji, 4,228,647, Cl. 368-185.000.

Kabushiki Kaisha Hirai Giken: *See*—
Hirai, Takashi; and Hino, Tadahiro, 4,228,791, Cl. 126-450.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kisami, Nobuyuki, 4,228,878, Cl. 192-2.000.

Kabushiki Kaisha Togowa Gomu Seizosho: *See*—
Yamaguchi, Yukio; Ishihara, Kenji; and Yonekura, Kikuo, 4,229,341, Cl. 260-42.160.

Kabushikikaisha Anoa: *See*—
Shimizu, Takeshi, 4,229,003, Cl. 273-1.00E.

Kadambi, Vedanth: *See*—
Keramati, Bahram; and Kadambi, Vedanth, 4,228,959, Cl. 239-451.000.

Kahan, Frederick M.: *See*—
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,229,534, Cl. 435-119.000.

Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, to Merck & Co., Inc. Acetylthienamycin production. 4,229,534, Cl. 435-119.000.

Kahn, Marvin J.; Malchodi, Robert J.; Paine, Joseph P.; Rogers, Milton J.; and Zouck, Robert L., to AAI Corporation. Glide bomb. 4,228,737, Cl. 102-3.000.

Kai, Tamotsu; Tsurumi, Michio; Sakakiyama, Takashi; and Horiuchi, Kunihiro, to Asahi-Dow Limited. Method for drying wood material. 4,229,507, Cl. 428-541.000.

Kaise, Hirotsugu: *See*—
Miyazaki, Wasei; Kaise, Hirotsugu; Nakano, Yoshimasa; Izawa, Taketoshi; Oshiro, Yasuo; and Shinohara, Masanao, 4,229,466, Cl. 424-279.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Housh, Lloyd M.; and Alder, William R., 4,229,423, Cl. 423-164.000.

Kaizu, Yasuo: *See*—
Takahashi, Nobuaki; Funasaka, Eiichi; Shinozaki, Masanobu; and Kaizu, Yasuo, 4,229,619, Cl. 179-1.00D.

Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kitada, Hisashi, to Mitsubishi Chemical Industries Limited. Process for preparing polyolefin. 4,229,558, Cl. 526-125.000.

Kakusai Denshin Denwa Kabushiki Kaisha: *See*—
Enomoto, Hajime, 4,229,820, Cl. 375-27.000.

Kalenian, Paul A. Combustion heater. 4,228,783, Cl. 126-112.000.

Kalnasy, Kenneth A.; and Kalnasy, Marcia, to Kaplan-Stern Environmental, Inc. Tamper proof rodent baiting station. 4,228,613, Cl. 43-131.000.

Kalnasy, Marcia: *See*—
Kalnasy, Kenneth A.; and Kalnasy, Marcia, 4,228,613, Cl. 43-131.000.

Kamei, Kuniaki: *See*—
Arai, Eisuke; Kamei, Kuniaki; Kawasaki, Akio; Takagi, Fumio; Shirai, Koichi; and Orihara, Yasuharu, 4,229,239, Cl. 156-155.000.

Kampe, Wolfgang; Stach, Kurt, deceased; by Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, to Boehringer Mannheim GmbH. Aminopropanol substituted indole compounds and compositions for the treatment of cardiac and circulatory diseases. 4,229,464, Cl. 424-274.000.

Kamynin, Jury S.: *See*—
Alt, Viktor V.; Mischenkov, Alexandr A.; Ponomarev, Viktor A.; Avdjushev, Eduard L.; Kamynin, Jury S.; Baryshnikov, Vladimir P.; Levin, Grigory K.; and Orlov, Alexei A., 4,228,679, Cl. 73-117.300.

Kanai, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Gas-liquid contacting apparatus. 4,229,417, Cl. 422-176.000.

Kanbe, Masaru: *See*—
Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, 4,229,523, Cl. 430-532.000.

Kandalova, Valentina D.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Kansas University Endowment Association: *See*—
Mitscher, Lester A.; Clark, George W., III; and Hudson, Paul B., 4,229,592, Cl. 560-231.000.

Kao Soap Company, Limited: *See*—
Aigami, Koji; Inamoto, Yoshiaki; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,229,375, Cl. 260-563.00P.
Takaishi, Naotake; Inamoto, Yoshiaki; and Matsukane, Masamoto, 4,229,324, Cl. 252-522.00R.

Kaplan-Stern Environmental, Inc.: *See*—
Kalnasy, Kenneth A.; and Kalnasy, Marcia, 4,228,613, Cl. 43-131.000.

Kappelsberger, Erwin: *See*—
Koy, Johannes; Rappold, Franz; and Kappelsberger, Erwin, 4,229,639, Cl. 219-121.0EM.

Karbowski, Sylvester G., to Palmieri, Louis W.; and Palmieri, Marcia K. Cut-off saw attachment for machine tool. 4,228,710, Cl. 83-794.000.

Kardex Systems, Inc.: *See*—
Jones, Dennis L., 4,228,906, Cl. 211-126.000.

Karino, Kimiji; Nagano, Masami; and Momono, Masakichi, to Hitachi, Ltd. Carburetor with starting means. 4,229,384, Cl. 261-39.00D.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Bogucki, Bogdan, 4,229,628, Cl. 200-61.180.

Karmann, Hans-Georg: *See*—
Baumann, Hans-Peter; Karmann, Hans-Georg; and Wiedemann, Achim, 4,229,172, Cl. 8-533.000.

Kasper Instruments, Inc.: *See*—
Schulte, Harvey L., 4,228,902, Cl. 211-41.000.

Kass, John J.; and Johannsen, Donald O., to Deere & Company. Feedback shaft extending between swashplate and displacement control valve. 4,229,144, Cl. 417-222.000.

Kasugai, Hiroshi: *See*—
Shigematsu, Taichiro; Yoshida, Kenji; Nakazawa, Makoto; Kasugai, Hiroshi; and Tsuda, Masataka, 4,229,461, Cl. 424-270.000.

Katagiri, Shigenobu: *See*—
Monma, Hisayoshi; Katagiri, Shigenobu; and Kozawa, Hiroomi, 4,228,938, Cl. 226-9.000.

Kataoka, Hiroshi: *See*—
Nagumo, Tadashi; Yasuike, Akio; and Kataoka, Hiroshi, 4,229,395, Cl. 264-51.000.

Kathawala, Faizulla G., to Sandoz, Inc. Unsaturated fatty acid hydrazides. 4,229,463, Cl. 424-274.000.

Kato, Osamu: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,229,221, Cl. 106-58.000.

Kato, Yoshiaki, to Citizen Watch Co., Ltd. Electronic timepiece with indication disk for internal state of timepiece. 4,228,646, Cl. 368-66.000.

Kato, Yoshiki: *See*—
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.

Kato, Yuzo: *See*—
Kurahayashi, Sadasuke; Kato, Yuzo; Watanabe, Asao; Tsuda, Shin; and Muto, Hakaru, 4,229,768, Cl. 358-261.000.

Katoh, Tatuya, to Ricoh Company, Ltd. Electrophotography with uniform exposure for residual potential. 4,229,511, Cl. 430-55.000.
Katsunuma, Nobuhiko. Glucocorticoid sparing factor and process for the production of the same. 4,229,571, Cl. 536-18.000.
Katzakian, Terry A. Water bed sheet frame. 4,228,555, Cl. 5-498.000.
Kawabata, Yasuziro: *See*—
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,229,381, Cl. 568-454.000.
Kawamura, Naoto; Iizuka, Kiyoshi; Tanaka, Nobuyoshi; Kuwayama, Tetsuro; Matsumoto, Kazuya; and Goshima, Takeshi, to Canon Kabushiki Kaisha. Information output unit. 4,229,750, Cl. 346-107.00R.
Kawasaki, Akio: *See*—
Arai, Eisuke; Kamei, Kuniaki; Kawasaki, Akio; Takagi, Fumio; Shirai, Koichi; and Orihara, Yasuharu, 4,229,239, Cl. 156-155.000.
Kawasaki, Motoo: *See*—
Kobayashi, Hisamine; Kawasaki, Motoo; Mizumoto, Shozo; Nawafune, Hidemi; and Suzuki, Sadamasa, 4,229,276, Cl. 204-222.000.
Kawasaki Steel Corporation: *See*—
Shinohara, Yoshiaki, 4,229,163, Cl. 432-194.000.
Kawasaki, Yoshitaka: *See*—
Ohmukai, Yoshimi; Tomisawa, Takeshi; and Kawasaki, Yoshitaka, 4,229,159, Cl. 431-328.000.
Kay, James C. Solar energy collector. 4,228,789, Cl. 126-439.000.
Kazino, Hiroshi, to Kabushiki Kaisha Aoyama Seisakusho. Upset bolt. 4,228,722, Cl. 85-9.00R.
Kazino, Mitsutaka: *See*—
Watanabe, Kikuo; Kazino, Mitsutaka; and Yamazaki, Hisashi, 4,229,683, Cl. 318-466.000.
Keene, George W. Plectrum for stringed musical instruments. 4,228,719, Cl. 84-322.000.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Werner, Paul, 4,229,041, Cl. 297-468.000.
Kelbel, Donald W., to Borg-Warner Corporation. Transmission shift control apparatus. 4,228,693, Cl. 74-339.000.
Kellogg, Thomas W., to American Can Company. Cup dispensing apparatus. 4,228,918, Cl. 221-65.000.
Kelsey Hayes Co.: *See*—
Rinker, Kurt H.; and Evans, Anthony C., 4,228,726, Cl. 92-168.000.
Kemp, James M. Growth system for crustaceans and fish. 4,228,762, Cl. 119-2.000.
Kennametal Inc.: *See*—
Bartley, Donald L., 4,229,127, Cl. 408-158.000.
Kennedy Joseph P.: *See*—
Thaler, Warren A.; Buckley, Donald J.; and Kennedy Joseph P., 4,229,325, Cl. 260-5.000.
Kent County Council: *See*—
Bourner, Malcolm S., 4,229,701, Cl. 328-10.00G.
Kenworthy, E. J. Doyle, to Mead Corporation, The. Method for fabricating and the solid metal orifice plate for a jet drop recorder produced thereby. 4,229,265, Cl. 204-11.000.
Kepley, Garry D.: *See*—
Haben, Dale E.; Kepley, Garry D.; and Vander Molen, Gordon L., 4,229,624, Cl. 179-18.00E.
Keramati, Bahram; and Kadambi, Vedanth, to General Electric Company. Rotating nozzle expander. 4,228,959, Cl. 239-451.000.
Kern, Georg, to Dyckerhoff & Widman Aktiengesellschaft. Steel rods, especially reinforcing or tensioning rods. 4,229,501, Cl. 428-399.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Forster, Siegfried, 4,229,257, Cl. 176-60.000.
Kerns, Ralph M., to Abbott Laboratories. Probe and syringe drive apparatus. 4,228,831, Cl. 141-27.000.
Kerr, David L.: *See*—
Hall, Lewis W., Jr.; Kerr, David L.; Hollstein, Elmer J.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,229,612, Cl. 585-823.000.
Kessler, Achill: *See*—
Linder, Ernst; Rembold, Helmut; Teegen, Walter; Kessler, Achill; and Ehmann, Roland, 4,229,147, Cl. 417-283.000.
Keystone Consolidated Industries, Inc.: *See*—
Davis, James P.; and Smith, Robert W., 4,228,733, Cl. 100-4.000.
Khodosov, Nikolai A.: *See*—
Berber, Viktor A.; Khodosov, Nikolai A.; Kosygin, Stanislav A.; Mozyakov, Vladimir I.; and Lapshev, Igor M., 4,228,948, Cl. 233-3.000.
Kiefer, Jurg; and Haug, Theobald, to Ciba-Geigy Corporation. Process for producing aliphatically N-substituted maleimides. 4,229,351, Cl. 260-326.260.
Kiehs, Karl: *See*—
Theobald, Hans; Wuerzer, Bruno; and Kiehs, Karl, 4,229,205, Cl. 71-92.000.
Kiencke, Uwe: *See*—
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, 4,228,700, Cl. 74-866.000.
Kiesel, George A.: *See*—
Ingram, James R., Jr.; and Kiesel, George A., 4,228,953, Cl. 235-480.000.
Kiess, Ronald J., to Wabash, Inc. Capacitor discharge ignition system with timing control arrangement. 4,228,780, Cl. 123-596.000.
Kiga, Hidetaka: *See*—
Sano, Kozo; Kiga, Hidetaka; and Ikarashi, Takeo, 4,229,373, Cl. 260-561.00R.
Kikkoman Shoyu Co., Ltd.: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,228,932, Cl. 222-368.000.
Kikuchi Kogyo K.K.: *See*—
Kikuchi, Kouichi, 4,228,829, Cl. 139-408.000.
Kikuchi, Kouichi, to NSK-Warner K.K.; and Kikuchi Kogyo K.K. Webbing for seat belt. 4,228,829, Cl. 139-408.000.
Kikuchi, Makoto; and Yamada, Keijyu, to Porceny Co., Ltd. Dowel pin setting instrument. 4,229,167, Cl. 433-74.000.
Kimball International, Inc.: *See*—
Howell, Stephen L., 4,228,714, Cl. 84-1.010.
Kimura, Shinhichi. Leveling pole. 4,228,590, Cl. 33-138.000.
Kimura, Tadashi, to Olympus Optical Co., Ltd. Focusing optical system for single-lens reflex. 4,229,087, Cl. 354-23.00R.
Kimura, Takao: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Process for beneficiating gold. 4,229,209, Cl. 75-1.00R.
King-Seeley Thermos Co.: *See*—
Anderson, Gordon H., 4,228,619, Cl. 51-163.100.
Kirchlechner, Richard, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of sterically uniform, natural 6-thiatetracycline derivatives. 4,229,582, Cl. 549-25.000.
Kirk, Norbert A. Brush device. 4,228,559, Cl. 15-75.000.
Kirkpatrick, Allen R., to Spire Corporation. Method involving pulsed beam processing of metallic and dielectric materials. 4,229,232, Cl. 148-1.500.
Kisami, Nobuyuki, to Kabushiki Kaisha Komatsu Seisakusho. Control device for controlling accelerator and brake switches. 4,228,878, Cl. 192-2.000.
Kishida, Minolu: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Kishida, Minolu, 4,229,332, Cl. 260-22.00T.
Kishimoto, Shinzo: *See*—
Yoneyama, Masakazu; and Kishimoto, Shinzo, 4,229,524, Cl. 430-536.000.
Kisling, Russell L. Screed support. 4,229,118, Cl. 404-72.000.
Kister, Albert T.: *See*—
Gum, Clarence R.; and Kister, Albert T., 4,229,607, Cl. 585-520.000.
Kisters, Theodor; and Vogler, Alfred, to Babcock-BSH Aktiengesellschaft vormals Buttner-Schilde-Haas AG. Process and apparatus for the absorptive removal of pollutants from waste gases. 4,229,411, Cl. 422-62.000.
Kiszelly, Eniko: *See*—
Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, 4,229,350, Cl. 260-243.300.
Kita, Toru, to Nissan Motor Company, Limited. Air induction apparatus for use with karman vortex shedding flow meter. 4,228,768, Cl. 123-494.000.
Kitada, Hisashi: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kitada, Hisashi, 4,229,558, Cl. 526-125.000.
Kitai, Kiyoshi; Onda, Eiichi; Yonemoto, Tomoo; and Nagaoka, Shinji, to Seiko Koki Kabushiki Kaisha. Automatic focusing device for camera. 4,229,089, Cl. 354-25.000.
Kitamura, Mitsugu: *See*—
Kanni, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, 4,229,417, Cl. 422-176.000.
Kitamura, Shigeyoshi: *See*—
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,229,469, Cl. 424-304.000.
Kitano, Kazuaki: *See*—
Imada, Akira; Kitano, Kazuaki; and Asai, Mitsuko, 4,229,436, Cl. 424-117.000.
Kitao, Saburo: *See*—
Mitani, Yutaka; Tokuda, Katumi; and Kitao, Saburo, 4,229,786, Cl. 363-126.000.
Kitcher, James R.: *See*—
Chiu, George T.; Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,229,247, Cl. 156-643.000.
Kiuchi, Michio: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,228,932, Cl. 222-368.000.
Kiwala, Jacob: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,229,599, Cl. 568-819.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,229,314, Cl. 252-174.110.
Klabacka, Bedrich; Polansky, Josef; and Hynek, Josef, to Koh-i-noor Hardtmuth, oborovy podnik. Plastic modified writing compositions. 4,229,334, Cl. 260-28.50A.
Klein, Peter, to Messerschmitt-Bolkow-Blohm GmbH. Infantry projectile. 4,228,973, Cl. 244-3.100.
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., to A/S Cheminova. (2,2-Disubstituted vinyl)y-butyrolactones. 4,229,353, Cl. 260-343.600.

Klinkhammer, Ralf L.: *See*—
Dunkel, Franz-Heinz; Klinkhammer, Ralf L.; Nebel, Heinz; Spanner, Siegfried; and Seibel, Gerd, 4,228,579, Cl. 29-430.000.
Klipping, Gustav, to Deutsche Forschungs- und Versuchsanstalt fur Luftund Raumfahrt e.V. Cryogenic apparatus. 4,228,662, Cl. 62-216.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Herschmann, Otto; Zernig, Norbert; Holthausen, Dieter; Stock, Hugo; and Tholen, Paul, 4,228,655, Cl. 60-602.000.
Klockner-Humboldt-Wedag AG: *See*—
Abelitis, Andris, 4,229,226, Cl. 106-100.000.
Knaflic, France; and Miller, Franz-Friedrich, to BASF Aktiengesellschaft. Lime-free and sulfide-free liming process. 4,229,175, Cl. 8-94.170.
Knox, Raymond L.; and Lindsay, Charles D., to A-T-O Inc. Battery discharge indicator. 4,229,688, Cl. 320-48.000.
Kobayashi, Hisamine; Kawasaki, Motoo; Mizumoto, Shozo; Nawafune, Hidemi; and Suzuki, Sadamasa, to Shikishima Tipton Manufacturing Co. Ltd.; and Motoo Kawasaki. Vibratory plating apparatus. 4,229,276, Cl. 204-222.000.
Kobayashi, Hitoshi. Roll blind. 4,228,843, Cl. 160-306.000.
Kobayashi, Katsumi: *See*—
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,229,535, Cl. 435-128.000.
Kobayashi, Kengo; and Imazeki, Ryoji, to Fujitsu Fanuc Limited. Numerical control unit having a cassette type memory. 4,229,804, Cl. 364-900.000.
Kobayashi, Reisuke: *See*—
Miwa, Tan; Kobayashi, Reisuke; and Takita, Kiyoshi, 4,229,539, Cl. 435-207.000.
Kobayashi, Teruaki: *See*—
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.
Kobayashi, Toyohiko; Tsuruta, Haruki; and Yoshida, Toshio, to Takasago Perfumery Co., Ltd. Norbornane and norbornene derivatives. 4,229,600, Cl. 568-820.000.
Kobe Steel, Limited: *See*—
Higashi, Kazo; Nakanishi, Sadayuki; and Fukunaga, Akio, 4,228,988, Cl. 251-327.000.
Kobylinski, Thaddeus P.: *See*—
Wu, Ching-Yong; and Kobylinski, Thaddeus P., 4,229,601, Cl. 568-860.000.
Kodama, Hiroyuki: *See*—
Yagi, Akihiro; Kuchinomachi, Yasuo; and Kodama, Hiroyuki, 4,228,807, Cl. 128-732.000.
Koeda, Takemi: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
Koenig, Karl-Heinz: *See*—
Oeser, Heinz-Guenter; Koenig, Karl-Heinz; and Mangold, Dietrich, 4,229,365, Cl. 260-465.00G.
Koffski, Leonard E., to Talbot Industries, Ltd. Bracket. 4,228,871, Cl. 182-184.000.
Koga, Shigeto: *See*—
Tanabe, Kaichi; Koga, Shigeto; and Maeda, Yoshinori, 4,228,943, Cl. 228-182.000.
Kogawa, Yoshio: *See*—
Kanai, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, 4,229,417, Cl. 422-176.000.
Koh-i-noor Hardtmuth, oborovy podnik: *See*—
Klabacka, Bedrich; Polansky, Josef; and Hynek, Josef, 4,229,334, Cl. 260-28.50A.
Kohl, Paul A.: *See*—
Buckley, Reginald R.; and Kohl, Paul A., 4,229,269, Cl. 204-109.000.
Kohley, Charles R., to LeBoeuf, Eugene A. Transport iock for lift bed trailer jackbox. 4,229,019, Cl. 280-438.00R.
Kokotailo, George T., to Mobil Oil Corporation. Crystalline zeolite product constituting ZSM-5/ZSM-11 intermediates. 4,229,424, Cl. 423-328.000.
Kolind-Andersen, Hans: *See*—
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., 4,229,353, Cl. 260-343.600.
Koloczek, Wiktor; Dobaj, Edward; and Zaremba, Tadeusz, to Instytut Spawalnictwa. Welding transformer with drooping voltage-current characteristics. 4,229,721, Cl. 336-133.000.
Kondo, Kiyoshi; and Suda, Minoru, to FMC Corporation. Method to prepare (+)-cis-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylic acid. 4,229,593, Cl. 562-401.000.
Kondo, Toshiyuki; and Ando, Masamoto, to Aisin Seiki Company, Limited. Hydraulic pressure control system for split brake system. 4,229,052, Cl. 303-115.000.
Konii, Susumu; Yoshimura, Yukio; Nanaumi, Ken; Yasuzawa, Kohei; Yoshida, Takeshi; and Shinko, Toyotaro, to Hitachi Chemical Company, Ltd. Process for producing phenolic resins. 4,229,330, Cl. 260-19.00R.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kurita, Yoshio; and Iwaki, Akio, 4,229,514, Cl. 430-195.000.
Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, 4,229,523, Cl. 430-532.000.
Konstruktie J. Lambrechts p.v.b.a.: *See*—
Beyens, Jozef; Dewit, Guillaume; and Lambrechts, Jules, 4,228,927, Cl. 222-148.000.
Koppensteiner, Eugene F., to Bell & Howell Company. Web supply and take-up system. 4,228,972, Cl. 242-201.000.
Koral, Marvin: *See*—
Feldman, Martin L.; Goodman, Donald; Koral, Marvin; Miller, Robert S.; and Stanaback, Robert J., 4,229,569, Cl. 528-501.000.
Korom, Arpad: *See*—
Thommen, Werner F.; Fehr, Werner; and Korom, Arpad, 4,229,670, Cl. 307-360.000.
Korotkevich, Boris S.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.
Kosaka, Shogo: *See*—
Ohkuma, Kazuhiko; Takagi, Hideo; Nakata, Akira; and Kosaka, Shogo, 4,229,465, Cl. 424-274.000.
Kosoczky, Ibolya: *See*—
Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, 4,229,350, Cl. 260-243.300.
Kosti, Carl M. Bacteriostatic deodorant water coloring toilet element. 4,229,410, Cl. 422-28.000.
Kosuda, Hiroyuki: *See*—
Fukuta, Kenji; Ono-Oka, Ryuzo; Yoshida, Masatoshi; Saito, Kazuhisa; and Kosuda, Hiroyuki, 4,229,397, Cl. 264-113.000.
Kosygin, Stanislav A.: *See*—
Berber, Viktor A.; Khodosov, Nikolai A.; Kosygin, Stanislav A.; Mozyakov, Vladimir I.; and Lapshev, Igor M., 4,228,948, Cl. 233-3.000.
Kotler, Richard G.; and Bricmont, Francis H., to Washington Steel Corporation. Closure apparatus for a slab furnace and method of heating slabs therein. 4,229,162, Cl. 432-6.000.
Kovar, Henry C.: *See*—
Anderson, Edward M., 4,228,610, Cl. 43-42.410.
Koy, Johannes; Rappold, Franz; and Kappelsberger, Erwin, to Steigerwald Strahltechnik GmbH. Energy beam welding method. 4,229,639, Cl. 219-121.0EM.
Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; Onda, Eiichi; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Control device in a shutter for a camera. 4,229,093, Cl. 354-266.000.
Koyanagi, Katubumi: *See*—
Take, Hiroshi; Koyanagi, Katubumi; and Uede, Hisashi, 4,229,080, Cl. 350-357.000.
Kozawa, Hiroomi: *See*—
Monma, Hisayoshi; Katagiri, Shigenobu; and Kozawa, Hiroomi, 4,228,938, Cl. 226-9.000.
Kozuki, Susumu: *See*—
Date, Nobuaki; Kozuki, Susumu; and Iwashita, Tomonori, 4,229,091, Cl. 354-173.000.
Kramer, George M., to Exxon Research & Engineering Co. Isomerization alkylation systems. 4,229,611, Cl. 585-728.000.
Kramer, Manfred: *See*—
Ritter, Ernst; Trui, Josef; and Kramer, Manfred, 4,228,774, Cl. 123-562.000.
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 1-azol-1-yl-1-phenoxy-2-alkane ethers. 4,229,459, Cl. 424-269.000.
Kramer, Wolfgang: *See*—
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.
Kranz, Eckart: *See*—
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.
Kraszewski, Richard; and Damiguet, Jean J. Cement-based powdered water-repellent composition, and its applications. 4,229,225, Cl. 106-99.000.
Krause, Joachim; Eidenschink, Rudolf; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline cyclohexane derivatives. 4,229,315, Cl. 252-299.000.
Kreske, Alvin, Jr. Lollipop and method of making same. 4,229,482, Cl. 426-134.000.
Krieg, John J., to Eaton Corporation. Lash adjustment means for valve gear of an internal combustion engine. 4,228,771, Cl. 123-90.550.
Krilanovich, Nicholas J., to Raytheon Company. Radio frequency signal direction finding systems. 4,229,740, Cl. 343-113.00R.
Krofchak, David. Solidification of aqueous sludge. 4,229,295, Cl. 210-723.000.
Kroll, Steve: *See*—
Schindler, James C.; and Kroll, Steve, 4,228,730, Cl. 99-329.00R.
Krone, Kenneth T.; and Balzano, Quirino, to Motorola, Inc. Voltage controlled slow wave transmission line. 4,229,717, Cl. 333-156.000.
Krug, Hans-Dietrich; and Mildenberger, Willi, to Carl Freudenberg, Firma. Shoe bottom. 4,228,600, Cl. 36-32.00R.
Kruger, Bradford E., to International Telephone and Telegraph Corporation. Edge slotted waveguide antenna array with selectable radiation direction. 4,229,745, Cl. 343-771.000.
Kruse, John M.; and Gelnett, Leland E., to Rockwell International Corporation. Axial flow throttling valve. 4,228,819, Cl. 137-489.000.

Krutenat, Richard C.; and Liu, Chih-an, to Exxon Research & Engineering Co. Passivated, particulate high Curie temperature magnetic alloys. 4,229,234, Cl. 148-105.000.
Krutsch, John R.: *See—*
Barlow, Gordon A.; Janiszewski, Anthony T.; and Krutsch, John R., 4,229,005, Cl. 273-86.00D.
Kryder, Mark H., to International Business Machines Corporation. Current controlled disk replicator. 4,229,807, Cl. 365-12.000.
Kubota, Hayato: *See—*
Oura, Mareni; Tsumura, Haruo; and Kubota, Hayato, 4,229,483, Cl. 426-250.000.
Kuchenbecker, Morris W., to American Can Company. Carton. 4,228,946, Cl. 229-33.000.
Kuchinomachi, Yasuo: *See—*
Yagi, Akihiro; Kuchinomachi, Yasuo; and Kodama, Hiroyuki, 4,228,807, Cl. 128-732.000.
Kuchta, August D.: *See—*
Gray, Russell H.; and Kuchta, August D., 4,229,518, Cl. 430-273.000.
Kuhlmann, Joachim; and Moser, Helmut, to Licentia Patent-Verwaltungs-G.m.b.H. Data transmission system. 4,229,819, Cl. 375-23.000.
Kulischenko, Walter, to Pennwalt Corporation. Remote controls for marine engine employing rotatable flexible shafts. 4,228,760, Cl. 440-86.000.
Kulling, Achim M.: *See—*
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Kumazawa, Shunichi: *See—*
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, 4,229,552, Cl. 525-437.000.
Kumiai Chemical Industry Co., Ltd.: *See—*
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,229,535, Cl. 435-128.000.
Miwa, Tan; Kobayashi, Reisuke; and Takita, Kiyoshi, 4,229,539, Cl. 435-207.000.
Kunitoh, Sakae: *See—*
Matsuki, Takeshi; Maruyama, Koichi; Osakabe, Kiniharu; and Kunitoh, Sakae, 4,229,675, Cl. 313-402.000.
Kuniya, Keiichi: *See—*
Arakawa, Hideo; Namekawa, Takashi; Kuniya, Keiichi; and Sugawara, Hiroyuki, 4,229,631, Cl. 200-144.00B.
Kuntz, Leland E.: *See—*
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Kuo, Mau-Jung: *See—*
Tolbert, William R.; Feder, Joseph; and Kuo, Mau-Jung, 4,229,531, Cl. 435-41.000.
Kuper, Hans-Heinrich: *See—*
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Kurahayashi, Sadasuke; Kato, Yuzo; Watanabe, Asao; Tsuda, Shin; and Muto, Hakaru, to Canon Kabushiki Kaisha. Information processing apparatus. 4,229,768, Cl. 358-261.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,229,570, Cl. 536-18.000.
Usami, Seiji; Oota, Masanori; Takita, Hitoshi; and Hashizume, Hideyuki, 4,229,549, Cl. 525-76.000.
Kurihara, Kunitoshi: *See—*
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Kurita, Yoshio; and Iwaki, Akio, to Konishiroku Photo Industry Co., Ltd. Photosensitive composition. 4,229,514, Cl. 430-195.000.
Kurtz, Walter: *See—*
Junge, Helmut; Kurtz, Walter; Dimroth, Peter; and Scherer, Hans, 4,229,343, Cl. 260-156.000.
Kurz, Craven H. Pulsating orthodontic appliance. 4,229,165, Cl. 433-24.000.
Kusuhara, Yoshinobu: *See—*
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigashi, Naofumi, 4,229,495, Cl. 428-36.000.
Kuwayama, Tetsuro: *See—*
Kawamura, Naoto; Iizuka, Kiyoshi; Tanaka, Nobuyoshi; Kuwayama, Tetsuro; Matsumoto, Kazuya; and Goshima, Takeshi, 4,229,750, Cl. 346-107.00R.
Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, 4,229,085, Cl. 353-75.000.
Kwik-Way Manufacturing Company: *See—*
Wagor, John C., 4,228,621, Cl. 51-241.0VS.
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Kishida, Minolu, to Unitika Ltd. Aromatic copolyester composition. 4,229,332, Cl. 260-22.00T.
Kyoto Ceramic Co., Ltd.: *See—*
Ikari, Kouji, 4,229,758, Cl. 357-74.000.
Kyowa Hakko Kogyo Co., Ltd.: *See—*
Takemoto, Yoshinori; Yasui, Toshihiro; Fujii, Kyoichi; Tanaka, Hiroshi; and Hirayama, Tatsuyuki, 4,229,446, Cl. 424-230.000.
Kysor Industrial Corporation: *See—*
Bischoff, Daniel R., 4,228,669, Cl. 70-379.00R.
La Maur Inc.: *See—*
Moore, Edward R.; and Riddle, Eldred O., 4,228,810, Cl. 132-7.000.
Laanio, Verena; Fory, Werner; and Schurter, Rolf, to Ciba-Geigy Corporation. Esters of 1,2-diphenyl-cyclohex-1-ene-4-carboxylic acid. 4,229,207, Cl. 71-107.000.
LaBarge, Robert L.; and Williams, Marvin H., to Aluminum Company of America. Solar heating panel. 4,228,851, Cl. 165-170.000.
Labofina S.A.: *See—*
Cahen, Raymond M., 4,229,361, Cl. 260-409.000.
Lacher, William A., to Burroughs Corporation. Drift compensated fiber optic-receiver. 4,229,831, Cl. 455-619.000.
Lagergren, Richard E.: *See—*
Anderson, Theodore H.; Beuch, Wallace E.; and Lagergren, Richard E., 4,229,113, Cl. 400-596.000.
Lago, Rudolph M.: *See—*
Chen, Nai Y.; Haag, Werner O.; and Lago, Rudolph M., 4,229,608, Cl. 585-640.000.
Lahme, Gerhard; Solter, Dieter; and Bohnsack, Hermann, to Eppendorf Geratebau Netheler & Hinz GmbH. Mixing cuvette. 4,229,104, Cl. 356-246.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Grenier, Maurice, 4,228,660, Cl. 62-79.000.
Laktjushina, Valentina Y.: *See—*
Andoniev, Sergei M.; Laktjushina, Valentina Y.; Medvedovsky, Viliam M.; and Shuster, Kim S., 4,229,190, Cl. 55-112.000.
Lambach, Heinrich W.; and Sorensen, Leif, to Brdr. Schur International A/S J. W. Schursvej. Packing of the folding bag type, primarily for pipe tobacco, and a folding bag member for such a packing. 4,228,900, Cl. 206-260.000.
Lambrechts, Jules: *See—*
Beyens, Jozef; Dewit, Guillaume; and Lambrechts, Jules, 4,228,927, Cl. 222-148.000.
Lamm, Gunther, to BASF Aktiengesellschaft. (2-Chloro-4-cyanophenyl) (4-dialkylaminophenyl)-diazine dye useful for transfer printing. 4,229,345, Cl. 260-205.000.
Lamy, Bernard: *See—*
Schneider, Michel; and Lamy, Bernard, 4,229,360, Cl. 260-403.000.
Langford, John F.: *See—*
Sharp, Gerald B.; Petrak, Karel L.; Boielle, John H.; Wagner, Hans M.; and Langford, John F., 4,229,519, Cl. 430-287.000.
Langlois, Marius, to Burlington Industries, Inc. Apparatus for terrying yarn. 4,228,665, Cl. 66-93.000.
Lanphear, Marvin P. Rigid chain system for articles with column structures. 4,228,979, Cl. 248-188.100.
Laporte, Jean-Loup: *See—*
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,229,181, Cl. 23-230.0EP.
Lapshev, Igor M.: *See—*
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Larkin, Joseph F., to American Cyanamid Company. Magazine tape containing a plurality of hemostatic clips. 4,228,895, Cl. 206-339.000.
LaSpesa, Richard E.: *See—*
Bellino, Joseph A.; Feldy, Edmund C.; LaSpesa, Richard E.; and Ramig, Robert J., Jr., 4,229,617, Cl. 178-92.000.
Laube, Rolf: *See—*
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Laurel Bank Machine Co., Ltd.: *See—*
Watanabe, Kenkichi, 4,228,632, Cl. 53-54.000.
Laurie, William A., to Fiberite Corporation. Mold component comprising a mat impregnated with a reaction product of an aminoplast resin and a polyalkylene glycol. 4,229,400, Cl. 264-225.000.
Laurin, Bernard L.: *See—*
Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., 4,229,228, Cl. 106-287.140.
Lawton, Peter; and Borjesson, Per, to Lawton, Peter. Snow-shoe. 4,228,601, Cl. 36-124.000.
Lazar, Remus I.; and Reichel, Richard C., to Velsicol Chemical Corporation. Dye compositions. 4,229,177, Cl. 8-435.000.
Lazar, Remus I.; and Reichel, Richard C., to Velsicol Chemical Corporation. Dye compositions. 4,229,178, Cl. 8-583.000.
Le Materiel Telephonique: *See—*
Le Dall, Jean-Claude; and Pasquet, Jean-Claude M., 4,229,142, Cl. 417-38.000.
Leake, William R.: *See—*
Shaver, Robert G.; and Leake, William R., 4,229,425, Cl. 423-449.000.
LeBoeuf, Eugene A.: *See—*
Kohley, Charles R., 4,229,019, Cl. 280-438.00R.
Le Breton, Edward T.: *See—*
Wiltshire, Arthur J.; Nara, Harry R.; Le Breton, Edward T.; and Bliley, Ward L., 4,228,575, Cl. 29-407.000.
Lechner, Uwe: *See—*
Brickl, Rolf; Eberhardt, Hans; Appel, Karl-Richard; Lechner, Uwe; and Merk, Walter, 4,229,479, Cl. 424-331.000.
Lechtenberg, Victor L.: *See—*
Richey, Clarence B.; Parsons, Samuel D.; Lechtenberg, Victor L.; and Holt, Donald A., 4,228,637, Cl. 56-341.000.
Lecinski, Frank H., Jr., to Continental Group, Inc., The. Squeeze-off closure with tamper indicating band. 4,228,909, Cl. 215-253.000.
Le Dall, Jean-Claude; and Pasquet, Jean-Claude M., to Le Materiel Telephonique. One-piece pumping device with ambivalent operation. 4,229,142, Cl. 417-38.000.

Ledley, Robert S., to National Biomedical Research Foundation. Method and system for whole picture image processing. 4,229,797, Cl. 364-515.000.

Lee, Henry L., Jr.; and Orlowski, Jan A., to Lee Pharmaceuticals. Method of applying self curing artificial nails. 4,229,431, Cl. 424-61.000.

Lee, Lap Y., to Hycel, Inc. Spectrophotometric measurement in a chemical testing apparatus. 4,229,179, Cl. 23-230.00R.

Lee Pharmaceuticals: *See*—
Lee, Henry L., Jr.; and Orlowski, Jan A., 4,229,431, Cl. 424-61.000.

Leedom, Marvin A.: *See*—
Demers, Robert R.; and Leedom, Marvin A., 4,228,782, Cl. 125-14.000.

Leeds & Northrup Company: *See*—
Hance, Richard J., 4,229,230, Cl. 136-234.000.

Lehmann, Gunter: *See*—
Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, 4,229,590, Cl. 560-174.000.

Lehtinen, Antti, to Valmet Oy. Method of improving properties of mechanical paper pulp without chemical reaction therewith. 4,229,250, Cl. 162-23.000.

Leibfreid, Russel B. Variable venturi carburetor. 4,229,385, Cl. 261-44.00H,

Leich, Robert A. Ammunition loader. 4,228,724, Cl. 86-26.000.

Leister, Harry M.; Donovan, Joseph C.; and Hall, Wilbur S., to Amchem Products, Inc. Control of autodeposition baths. 4,229,492, Cl. 427-345.000.

Lemmer, Helmut, to Starkstrom Schaltgeraetefabriken Sprindler Deissler GmbH & Co. KG. Contactor. 4,229,719, Cl. 335-132.000.

Lempicki, Alexander: *See*—
McCollum, Bill C.; and Lempicki, Alexander, 4,229,713, Cl. 331-94.50F.

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Binderup, Ernst T., 4,229,443, Cl. 424-200.000.

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Ruud, Alan J.; and Lewin, Ian, 4,229,782, Cl. 362-297.000.

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Kuhlmann, Joachim; and Moser, Helmut, 4,229,819, Cl. 375-23.000.

Lichte, Carl L., to Dresser Industries, Inc. Unitized rotary rock bit. 4,229,638, Cl. 219-121.0EM.

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Weinstock, Jacques; Lieber, Derek; and Hay, William D., 4,229,652, Cl. 250-308.000.

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Liljekvist, Bernt S.; and Persson, Anders E., to Sandvik Aktiebolag. Reamer bit for raise boring. 4,228,863, Cl. 175-344.000.

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Schmidt, Oskar; and Sibral, Walter, 4,229,561, Cl. 528-68.000.

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Forg, Wolfgang G., 4,229,195, Cl. 62-23.000.

Linder, Ernst; Rembold, Helmut; Teegen, Walter; Kessler, Achill; and Ehmann, Roland, to Robert Bosch GmbH. Rotary positive-displacement pump. 4,229,147, Cl. 417-283.000.

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Knox, Raymond L.; and Lindsay, Charles D., 4,229,688, Cl. 320-48.000.

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Peitsmeier, Karl; and Link, Manfred, 4,229,062, Cl. 339-82.000.

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Ichikawa, Atsushi; Tomita, Kenkichi; Horiuchi, Taku; Suzuki, Shin-ichi; and Sakuma, Akira, 4,229,471, Cl. 424-320.000.

Lipper, Karl-August: *See*—
Bruhne, Friedrich; and Lipper, Karl-August, 4,229,379, Cl. 568-437.000.

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Breidenstein, Charles J.; Caplan, Jerome S.; and Littlefield, Bruce G., 4,229,816, Cl. 370-100.000.

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Krutenat, Richard C.; and Liu, Chih-an, 4,229,234, Cl. 148-105.000.

Livesay, Richard E.: *See*—
Cobb, Delwin E.; and Livesay, Richard E., 4,229,044, Cl. 299-37.000.

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Gale, Leo R.; and Heilman, Robert R., 4,228,672, Cl. 72-130.000.

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Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,229,554, Cl. 525-438.000.

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Brownlee, Sherwood S.; and Lohr, Warren G., 4,229,060, Cl. 312-305.000.

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Carreau, Bernard A.; and Lombard, Gabriel, 4,229,082, Cl. 351-44.000.

Longfoot, Gerald: *See*—
Speaight, David C.; and Longfoot, Gerald, 4,228,727, Cl. 92-228.000.

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Piccardi, Paolo; and Longoni, Angelo, 4,229,470, Cl. 424-304.000.

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McGahee, Welbourne D., 4,228,611, Cl. 43-42.530.

Loos, Kurt: *See*—
Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, 4,228,825, Cl. 138-120.000.

Looschen, Floyd W. Transmitting means for use in a high speed, low noise digital data communication system. 4,229,621, Cl. 370-84.000.

Looschen, Floyd W. Receiving means for use in a high speed, low noise digital data communication system. 4,229,623, Cl. 370-4.000.

Lopez, Eugene F.: *See*—
Glover, Leon C.; and Lopez, Eugene F., 4,228,761, Cl. 116-201.000.

Lotspeich, James F., to Hughes Aircraft Company. Iso-index coupled-wave electro-optic filters. 4,229,073, Cl. 350-150.000.

Louthan, Rector P., to Phillips Petroleum Company. Preparation of dialkyl dithiodialkanoates. 4,229,588, Cl. 560-147.000.

Love, Walter F., to Corning Glass Works. Optical waveguide mode scrambler. 4,229,067, Cl. 350-96.150.

Lowe, Edward J.; and Ridgway, Frederick A., to Hooker Chemicals & Plastics Corp. Apparatus for preparing red phosphorus. 4,229,307, Cl. 250-543.000.

Lowe and Fletcher Limited: *See*—
Herriott, Leslie V., 4,228,667, Cl. 70-276.000.

Lowery, Richard K.; and Starinshak, Thomas W., to Rohco, Inc. Acid zinc plating baths and methods for electrodepositing bright zinc deposits. 4,229,268, Cl. 204-55.00R.

Lowther, Frank E., to Purification Sciences Inc. Gas turbine system. 4,228,659, Cl. 60-68.00Z.

Luber, Edward J., Jr.: *See*—
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,229,452, Cl. 424-250.000.

Lucas Industries Limited: *See*—
Mowbray, Dorian F.; and Edwards, Stephen, 4,228,960, Cl. 239-533.900.

Luce, David A., to Norlin Industries, Inc. Electronic musical instrument capable of generating a chorus sound. 4,228,717, Cl. 84-1.240.

Lucke, Roland, to Gebruder Lodige Maschinenbau GmbH of Elsener Str. Mixing machine with wedge-shaped or ploughshare-like mixing tools. 4,229,110, Cl. 366-343.000.

Luedtke, Arthur; and Bentley, William F., to United States of America, Federal Communications Commission. Directional annular slot antenna. 4,229,744, Cl. 343-769.000.

Luethi, Peter; and Steinmetz, Werner, to Zellweger Ltd. Cleaning apparatus for test electrodes. 4,228,814, Cl. 134-58.00R.

Luetzow, Howard J., to UOP Inc. Corrugated thimble tube for controlling control rod descent in nuclear reactor. 4,229,256, Cl. 176-36.00S.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Huber, Lothar; and Reitz, Werner, 4,228,882, Cl. 192-98.000.

Lukashov, Anatoly I.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

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Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Luthi, Rolf: *See*—
Corti, Christopher W.; Luthi, Rolf; and Vogt, Ernst, 4,228,670, Cl. 72-42.000.

Luz, Wilson S. Identity checking device. 4,229,023, Cl. 283-7.000.

Lyakishev, Nikolai P.: *See*—
Shushlebin, Boris A.; Lyakishev, Nikolai P.; Tregubenko, Viktor V.; Ignatenko, Gennady F.; and Subbotin, Nikolai I., 4,229,214, Cl. 75-133.000.

Lyles, George C. Combination fishing creel and seat. 4,228,894, Cl. 206-315.00R.

Lynch, Conrad L.: *See*—
Tobias, Michael A.; and Lynch, Conrad L., 4,229,555, Cl. 525-443.000.

Lyon, George W., to Dow Chemical Company, The. Method of dehydrogenation of alkyl aromatics to alkenyl aromatics. 4,229,603, Cl. 585-444.000.

Lyons, Keith. Locking washers. 4,228,837, Cl. 151-35.000.

Lysova, Valentina B.: *See*—
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N., 4,229,560, Cl. 528-4.000.

Maag Gear Wheel & Machine Co. Ltd.: *See*—
Sterki, Armin; and Sommer, Gerd, 4,228,591, Cl. 33-174.00L.

MacGlashan, William F., Jr.: *See*—
United States of America, National Aeronautics and Space Administration; and MacGlashan, William F., Jr., 4,228,656, Cl. 60-518.000.

Mack, Alberto; and Mack, Charing. Beverage can having a self contained straw. 4,228,913, Cl. 220-90.200.

Mack, Charing: *See*—
Mack, Alberto; and Mack, Charing, 4,228,913, Cl. 220-90.200.

MacLean-Fogg Company: *See*—
Hague, Richard E., 4,229,131, Cl. 410-12.000.

Macleod, Colin J.: *See*—
Rosie, Aeneas M.; and Macleod, Colin J., 4,229,798, Cl. 364-564.000.

Madec, Marcel: *See*—
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,229,181, Cl. 23-230.0EP.

Madray, Robert M. Gloves and holding rack therefor. 4,228,935, Cl. 223-111.000.

Madsen, Hans B.: *See*—
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., 4,229,353, Cl. 260-343.600.

Maeda, Yoshinori: *See*—
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Magnasco, Dante; and Marinoni, Livio, to Elektromedical Company S.r.l. Dilator for application in medical field. 4,228,801, Cl. 128-344.000.

Magyar, John: *See*—
Iversen, Arthur; and Magyar, John, 4,229,656, Cl. 250-447.000.

Maier, Alfred E.: *See*—
Wafer, John A.; and Maier, Alfred E., 4,229,630, Cl. 200-144.00B.

Maier, Reinhold: *See*—
Chadda, Madan M.; and Maier, Reinhold, 4,228,581, Cl. 29-578.000.

Majoie, Bernard, to Societe de Recherches Industrielles (SORI). Method of treatment of atheroma. 4,229,439, Cl. 424-180.000.

Majors, James P. Electrical adapter or connector. 4,229,061, Cl. 339-64.00M.

Makino, Yoshimi; and Shimizu, Hidetoshi, to Sony Corporation. Electrically conductive resin composition. 4,229,328, Cl. 260-16.000.

Malafouris, Dannie O. Fireplace forced air heating apparatus. 4,228,784, Cl. 126-121.000.

Malakhov, Igor K.: *See*—
Motin, Jury D.; Reformatsky, Igor A.; Sinitsyn, Pavel R.; Ivanov, Nikolai M.; Malakhov, Igor K.; and Ivanov, Boris I., 4,229,069, Cl. 350-96.290.

Malchodi, Robert J.: *See*—
Kahn, Marvin J.; Malchodi, Robert J.; Paine, Joseph P.; Rogers, Milton J.; and Zouck, Robert L., 4,228,737, Cl. 102-3.000.

Maldonado, Salomon: *See*—
Davison, Richard R.; Harris, William B.; and Maldonado, Salomon, 4,228,790, Cl. 126-444.000.

Malinowski, Stanley: *See*—
Arvanitis, Aristotelis S.; Re, Thomas W.; and Malinowski, Stanley, 4,229,718, Cl. 333-192.000.

Malmros, Carl-Henrik B. S., to Aktiebolaget Electrolux. Storage system including movable pallet racks. 4,229,135, Cl. 414-284.000.

Malov, Evgeny A.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Mangold, Dietrich: *See*—
Oeser, Heinz-Guenter; Koenig, Karl-Heinz; and Mangold, Dietrich, 4,229,365, Cl. 260-465.00G.

Mani, Siva A.; Hyman, Howard A.; and Daugherty, Jack D., to Avco Everett Research Laboratory, Inc. X-ray laser. 4,229,708, Cl. 331-94.50G.

Manis, Barry S.: *See*—
Morgan, Douglas J.; and Manis, Barry S., 4,229,789, Cl. 364-200.000.

Manoly, Arthur E., to Hughes Aircraft Company. Helical slow-wave structure assemblies and fabrication methods. 4,229,676, Cl. 315-3.500.

Manufacture Francaise d'Armes et Cycles de Saint-Etienne Manufrance S.A.: *See*—
Chacornac, Georges, 4,228,605, Cl. 42-1.00R.

Marantette, Ruth B.: *See*—
Marantette, William F.; and Marantette, Ruth B., 4,229,139, Cl. 415-29.000.

Marantette, William F.; and Marantette, Ruth B. Water powered high speed motor. 4,229,139, Cl. 415-29.000.

Marchant, David D.; and Bates, J. Lambert, to United States of America, Energy. Ceramic component for electrodes. 4,229,322, Cl. 252-521.000.

Marcus, Konrad H., to Prince Corporation. Vehicle position indicator with selectable position alarm means. 4,229,724, Cl. 340-23.000.

Margalit, Nehemiah, to ESB Technology Company. Non-aqueous primary battery having a bismuth (III) sulfide cathode. 4,229,509, Cl. 429-194.000.

Margolis, Barry I.: *See*—
Bendiner, Bernard; and Margolis, Barry I., 4,229,493, Cl. 428-2.000.

Marinoni, Livio: *See*—
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Marquis, Francois: *See*—
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,229,181, Cl. 23-230.0EP.

Marrujo, Ralph G.: *See*—
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Marshall, George D.: *See*—
Jensen, Earl D.; and Marshall, George D., 4,229,792, Cl. 364-200.000.

Marsoner, Hermann J., to AVL AG. Device for the withdrawal of blood. 4,228,808, Cl. 128-762.000.

Marteau d'Autry, Eric. Adjustable device for distributing liquid samples. 4,229,413, Cl. 422-100.000.

Marti, Karl, to PREMA GmbH. Coin sorter with striker means to propel non-standard size coins. 4,228,812, Cl. 133-3.00F.

Martin, Peter B. Portable sawmill. 4,228,708, Cl. 83-404.100.

Martinich, Pamela J.: *See*—
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Maruyama, Ichiro: *See*—
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Maruyama, Koichi: *See*—
Matsuki, Takeshi; Maruyama, Koichi; Osakabe, Kiniharu; and Kunitoh, Sakae, 4,229,675, Cl. 313-402.000.

Masaki, Hisaji: *See*—
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Mashio, Tasuku: *See*—
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,229,506, Cl. 428-539.000.

Maso-Therm Corporation: *See*—
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Massachusetts Institute of Technology: *See*—
Witt, August F.; and Raman, Ramaswamy V., 4,229,231, Cl. 148-1.500.

Masters, David H. Golf swing exercise device. 4,229,002, Cl. 272-117.000.

Masukata, Yoshimasa: *See*—
Shimano, Takashi; Masukata, Yoshimasa; and Sato, Hiromitsu, 4,229,392, Cl. 264-40.100.

Matsuda, Masaoki: *See*—
Nishimura, Kenji; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Uchiumi, Shinichiro, 4,229,591, Cl. 360-193.000.

Matsuda, Noriaki; and Enomoto, Kunio, to Hitachi, Ltd. Heat-treating method for pipes. 4,229,235, Cl. 148-127.000.

Matsuda, Yoshio, to Yoshida Kogyo KK. Slide fastener stringer. 4,228,566, Cl. 24-205.16C.
Matsukane, Masamoto: *See—*
Takaishi, Naotake; Inamoto, Yoshiaki; and Matsukane, Masamoto, 4,229,324, Cl. 252-522.00R.
Matsuki, Takeshi; Maruyama, Koichi; Osakabe, Kiniharu; and Kunitoh, Sakae, to Hitachi, Ltd. Color picture tube with internal funnel shaped magnetic shield. 4,229,675, Cl. 313-402.000.
Matsumoto, Kazuya: *See—*
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Matsuo, Takashi: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Yamauchi, Terukazu; Nishio, Katsufumi; Niino, Fusao; and Murasawa, Toyoaki, 4,228,963, Cl. 241-92.000.
Matter, Robert C., to General Motors Corporation. Process for making wrought, lead-calcium battery grid alloy having high temperature tensile strength stability. 4,228,580, Cl. 29-527.700.
Matyas, Stephen M.; Meyer, Carl H. W.; and Tuckerman, Louis B., III, to International Business Machines Corporation. Method and apparatus for enciphering blocks which succeed short blocks in a key-controlled block-cipher cryptographic system. 4,229,818, Cl. 375-2.000.
Matzner, Markus: *See—*
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Maupetit, Pierre: *See—*
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Mauser-Kommandit Gesellschaft: *See—*
Hammes, Theo, 4,228,911, Cl. 220-1.00R.
Maxwell, Paul R.: *See—*
Decker, Elmer L.; Moon, James; and Maxwell, Paul R., 4,228,682, Cl. 73-143.000.
Mayama, Masayoshi: *See—*
Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, 4,229,523, Cl. 430-532.000.
Mayer, Anton: *See—*
Burkhardt, Horst; Schwefel, Ernst; Baumgartner, Alfons; Mayer, Anton; and Rauth, Michael, 4,229,646, Cl. 235-92.0GC.
Mayer, Norbert; Pfahler, Gerhard; Scheidl, Franz; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Glycerol phosphites esterified with phenolcarboxylic acids. 4,229,382, Cl. 260-930.000.
Mayfield, Robert L.: *See—*
Thompson, James E.; and Mayfield, Robert L., 4,228,984, Cl. 248-636.000.
Maynard, Donald E.: *See—*
Sladek, Theodore E.; and Maynard, Donald E., 4,228,752, Cl. 114-67.00A.
Maynard, Thomas C.: *See—*
White, James A.; and Maynard, Thomas C., 4,229,284, Cl. 208-348.000.
McAllister, William A., to Westinghouse Electric Corp. Mercury metal-halide lamp including neodymium iodide, cesium and sodium iodide. 4,229,673, Cl. 313-225.000.
McCollum, Bill C.; and Lempicki, Alexander, to GTE Laboratories Incorporated. Stoichiometric rare earth laser material and laser based thereon. 4,229,713, Cl. 331-94.50F.
McCoy, Christopher B., to Douville-Johnston Corporation. Flexible drive coupling. 4,228,664, Cl. 64-14.000.
McDermott, Alistair Francis: *See—*
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McDonald, Herschel B.: *See—*
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McEvoy Oilfield Equipment Company: *See—*
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Morrill, Charles D., 4,229,027, Cl. 285-137.00A.
McFarland, Donald, to Amity Leather Products Company. Key case. 4,228,836, Cl. 150-40.000.
McGahee, Welbourne D., to Loop-A-Line, Inc. Method for fabricating fishing lures etc. 4,228,611, Cl. 43-42.530.
McGraw-Edison Company: *See—*
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McKinney Manufacturing Company: *See—*
Gwozdz, Joseph W., 4,228,561, Cl. 16-131.000.
McMahan, William H. Laser device. 4,229,709, Cl. 331-94.50T.
McNeilab, Inc.: *See—*
Rasmussen, Chris R., 4,229,462, Cl. 424-273.00R.
Mead, Claude F.; and Holmes, William F. Power plant for camping trailer. 4,229,661, Cl. 290-44.000.
Mead Corporation, The: *See—*
Hwang, Ki-Sup, 4,229,747, Cl. 346-1.100.
Kenworthy, E. J. Doyle, 4,229,265, Cl. 204-11.000.
Williams, Ted F.; and Cha, Charles L., 4,229,748, Cl. 346-75.000.
Mechanical Technology Incorporated: *See—*
Miller, William H., Jr., 4,229,054, Cl. 308-9.000.
Medical Products Institute Incorporated: *See—*
Trott, William A., 4,228,802, Cl. 128-349.00R.
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Melotti, Athos. Small-size toy animal having articulated limbs. 4,228,615, Cl. 46-22.000.
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Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,229,456, Cl. 424-256.000.
Bugianesi, Robert L.; Ponpipom, Mitree M.; and Shen, Tsung-Ying, 4,229,441, Cl. 424-182.000.
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Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
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Jones, Terry L.; and Miller, Brian S., 4,229,081, Cl. 350-361.000.
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Miller, Gladys D.: *See*—
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Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kitada, Hisashi, 4,229,558, Cl. 526-125.000.
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Sano, Kozo; Kiga, Hidetaka; and Ikarashi, Takeo, 4,229,373, Cl. 260-561.00R.
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Mizutani, Kazuko: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
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Mobil Oil Corporation: *See*—
Chen, Nai Y.; Haag, Werner O.; and Lago, Rudolph M., 4,229,608, Cl. 585-640.000.
Frangatos, Gerassimos, 4,229,310, Cl. 252-49.900.
Kokotailo, George T., 4,229,424, Cl. 423-328.000.
Peters, Alan W.; Bowes, Emmerson; and Stein, Thomas R., 4,229,282, Cl. 208-111.000.
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Moeser, John. Self-contained all-terrain living apparatus. 4,228,788, Cl. 126-437.000.
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D'Amico, John J., 4,229,578, Cl. 548-165.000.
Howe, Robert K., 4,229,204, Cl. 71-88.000.
Intille, George M., 4,229,188, Cl. 55-16.000.
Lin, Lawrence Y.; Gutsche, Henry W.; and Collier, James A., 4,228,578, Cl. 29-423.000.
Tolbert, William R.; Feder, Joseph; and Kuo, Mau-Jung, 4,229,531, Cl. 435-41.000.
Tolbert, William R.; and Feder, Joseph, 4,229,532, Cl. 435-41.000.
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Moore, Edward R.; and Riddle, Eldred O., to La Maur Inc. Care and treatment of curly human hair. 4,228,810, Cl. 132-7.000.
Moore, Lee P. Liquid soap dispenser and brush combination. 4,229,116, Cl. 401-275.000.
Moore, Lester P. Technique for modifying the capacity of gas-liquid separator. 4,229,191, Cl. 55-203.000.
Moore, Robert L., to Champion International Corporation. Pallet formed from two spaced, interlocking sheets of corrugated paperboard and rigid sleeves. 4,228,744, Cl. 108-51.300.
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Schoonmaker, Edward B.; and Moran, Paul W. T., 4,228,997, Cl. 271-315.000.
Moran, Raymond D., to PPG Industries, Inc. Position sensor. 4,228,886, Cl. 198-395.000.
Morgan, Barrie O.; and Carter, Merlon B., to Datotek, Inc. Portable electronic cryptographic device. 4,229,817, Cl. 375-2.000.
Morgan, Douglas J.; and Manis, Barry S., to NCR Corporation. System for transferring data between high speed and low speed memories. 4,229,789, Cl. 364-200.000.

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Mori, Shoichi; Ikeda, Yorifumi; and Nishikawa, Kikuo, to Takeda Chemical Industries, Ltd. Countercurrent liquid-solid contacting apparatus. 4,229,292, Cl. 210-673.000.
Morin, Boris P.; Voinova, Galina J.; Breusova, Irina P.; Stanchenko, Galina I.; and Rogovin, Zakhar A. Method for producing graft copolymers of cellulose or protein fiber with vinyl monomers. 4,229,326, Cl. 260-8.000.
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Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Transmission line carrier. 4,228,825, Cl. 138-120.000.
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Crosby, Lawton H., 4,228,991, Cl. 267-110.000.
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Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Morrill, Charles D., to McEvoy Oilfield Equipment Company. Remote automatic make-up stab-in sealing system. 4,229,027, Cl. 285-137.00A.
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Morse, Harold. Maze puzzle. 4,229,006, Cl. 273-153.00S.
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Groth, Edward J., Jr., 4,229,741, Cl. 370-24.000.
Huntington, Robert C., 4,229,730, Cl. 340-347.0NT.
Krone, Kenneth T.; and Balzano, Quirino, 4,229,717, Cl. 333-156.000.
Mourier, Georges, to Thomson-CSF. High-power hyperfrequency emission tube. 4,229,677, Cl. 315-3.600.
Moussie, Michel, to U.S. Philips Corporation. Programmable memory cell having semiconductor diodes. 4,229,757, Cl. 357-59.000.
Mowbray, Dorian F.; and Edwards, Stephen, to Lucas Industries Limited. Liquid fuel injectors. 4,228,960, Cl. 239-533.900.
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Mueller, Walter B., to W. R. Grace & Co. Process for making a multi layer polyolefin shrink film. 4,229,241, Cl. 156-243.000.
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Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, to Ciba-Geigy Corporation. Monazo pigments containing hydroxynaphthoylaminobenzimidazalone radical. 4,229,344, Cl. 260-157.000.
Muller, Roman, to Gebrueder Buehler AG. Method of degerming maize. 4,229,486, Cl. 426-483.000.
Mullerheim, Steven B.; and Williams, Fred G., to Great Circle Associates. Wastewater treatment with ultraviolet disinfection and increased capacity. 4,229,202, Cl. 71-8.000.
Mullersman, Ferdinand H.; and Stillwell, Billy E., to General Electric Company. Battery charger adapter system. 4,229,686, Cl. 320-2.000.
Mullins, John A., to Rolls-Royce Limited. Ducted fan gas turbine engine. 4,228,651, Cl. 60-226.00A.
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Muramatsu, Hiroshi, to Victor Company of Japan, Limited. Tape recorder having an automatic mode switching mechanism. 4,229,772, Cl. 360-69.000.
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Yamauchi, Terukazu; Nishio, Katsufumi; Niino, Fusao; and Murasawa, Toyoaki, 4,228,963, Cl. 241-92.000.
Murata Manufacturing Co., Inc.: *See*—
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Murib, Jawad H., to National Distillers and Chemical Corporation. Process for preparing aromatic esters. 4,229,587, Cl. 560-131.000.
Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, to Fujiya Confectionery Company Limited. Pharmaceutical composition containing the polysaccharide KGF-C as active ingredient. 4,229,440, Cl. 424-180.000.
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Murphy, Michael R., to Murphy Advantage Corporation, The. Universal implement for cleaning corrugated surfaces. 4,229,032, Cl. 294-51.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Preparation of a caryophyllene alcohol mixture. 4,229,599, Cl. 568-819.000.
Mussler, George K. Restoration of nickel-cadmium batteries. 4,229,508, Cl. 429-49.000.
Muto, Hakaru: *See*—
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Myers, John G., to Calgon Corporation. Ash sampling probe. 4,228,676, Cl. 73-28.000.
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Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,229,221, Cl. 106-58.000.
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Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, to Hitachi, Ltd. Method of manufacturing a paint composite for magnetic films. 4,229,312, Cl. 252-62.540.
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Burkholder, Ward J.; Miller, Glenn E.; and Nagel, Fritz J., 4,229,596, Cl. 568-768.000.
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Nagy, Jozsef: *See*—
Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, 4,229,350, Cl. 260-243.300.
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Nakada, Akira: *See*—
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Nakagawa, Tadashi: *See*—
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Nakamura, Shigeru; Shimamura, Isao; Nakamura, Taku; Sakaguchi, Shinji; Miyazako, Takushi; Sugiysma, Masatoshi; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Method for forming color images. 4,229,522, Cl. 430-390.000.
Nakamura, Takeshi, to Nippon Seiko Kabushiki Kaisha. Clutch release device of the self-centering type using a plastic deformation member. 4,228,881, Cl. 192-98.000.
Nakamura, Taku: *See*—
Nakamura, Shigeru; Shimamura, Isao; Nakamura, Taku; Sakaguchi, Shinji; Miyazako, Takushi; Sugiysma, Masatoshi; and Mitsui, Akio, 4,229,522, Cl. 430-390.000.
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Miyazaki, Wasei; Kaise, Hirotsugu; Nakano, Yoshimasa; Izawa, Taketoshi; Oshiro, Yasuo; and Shinohara, Masanao, 4,229,466, Cl. 424-279.000.
Nakata, Akira: *See*—
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DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,229,358, Cl. 260-397.200.
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Nashimoto, Ryo, to Honda Giken Kogyo Kabushiki Kaisha. Wiring of electrical equipments for motorcycles. 4,229,662, Cl. 307-9.000.
National Biomedical Research Foundation: *See*—
Ledley, Robert S., 4,229,797, Cl. 364-515.000.
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Murib, Jawad H., 4,229,587, Cl. 560-131.000.
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Naumann, Fritz, to Audi NSU Auto Union AG. Hydraulic power-steering system. 4,228,866, Cl. 180-132.000.
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Neefe, Charles W. Method of making cast aspheric lenses. 4,229,390, Cl. 264-1.000.
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Lipschutz, Paul, 4,229,278, Cl. 204-297.00R.
Nelson, David J., to Victor Fluid Power. Crossover relief valve. 4,228,818, Cl. 137-115.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-16-fluoro-PGE$_2$ compounds. 4,229,377, Cl. 568-380.000.
Nelson, Robert C., to West Virginia Armature Company. Fluorescent lamp for use in explosive atmospheres such as mines. 4,229,780, Cl. 362-218.000.
Nelson, Wilbur C. Animal nail clipper. 4,228,585, Cl. 30-29.000.
Nemoto, Ichiro: *See*—
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New York University: *See*—
Hodgins, Leonard T.; Finlay, Thomas H.; and Johnson, Alan J., 4,229,537, Cl. 435-177.000.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, to BASF Wyandotte Corporation. Flame retardant antistatic additives and antistatic fibers. 4,229,554, Cl. 525-438.000.
Newman, Joseph W. Vehicle windshield rain deflector system. 4,229,035, Cl. 296-95.00R.
Newman, William A., to Utah Research & Development Corporation. Temperature maintained battery system. 4,229,687, Cl. 320-2.000.
Niagara Bottle Washer Manufacturing Co.: *See*—
Vamvakas, Michael, 4,228,887, Cl. 198-408.000.
Nickoladze, Leo G. AC Synchronized generator. 4,229,689, Cl. 322-32.000.
Nieuwendijk, Joris A. M.: *See*—
Heijnemans, Werner A. L.; Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., 4,229,720, Cl. 335-213.000.
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Nijhuis, Jan; and Terwee, Thomas H. M., to Hollandse Signaalapparaten B.V. Method for the manufacture of twistless or substantially twistless yarn. 4,228,643, Cl. 57-297.000.
"NIKEX" Nehezipari Kulkereskedelmi Vallalat: *See*—
Pucher, Janos; and Schmider, Antal, 4,229,143, Cl. 417-53.000.
Nilssen, Ole K.: *See*—
Berlin, Donald M., Jr.; Mensing, Clifford E.; and Nilssen, Ole K., 4,229,680, Cl. 315-200.00R.
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Uchiyama, Yasuji; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,228,712, Cl. 84-1.010.
Nippon Oil Co., Ltd.: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,229,221, Cl. 106-58.000.
Nippon Seiko Kabushiki Kaisha: *See*—
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Nippon Soda Company, Ltd.: *See*—
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Yoshida, Hiroshi; Tabara, Nobuo; and Aoki, Keiji, 4,229,793, Cl. 364-431.000.
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Nishimura, Kenji; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Uchiumi, Shinichiro, 4,229,591, Cl. 560-193.000.
Nishikawa, Kikuo: *See*—
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Nishimura, Kenji; Uchiumi, Shinichiro; Fujii, Kozo; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, to UBE Industries, Ltd. Process for preparing a diester of oxalic acid. 4,229,589, Cl. 560-193.000.
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Nishimura, Osamu: *See*—
Fujino, Masahiko; Nishimura, Osamu; and Takaoki, Muneo, 4,229,438, Cl. 424-177.000.
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Yamauchi, Terukazu; Nishio, Katsufumi; Niino, Fusao; and Murasawa, Toyoaki, 4,228,963, Cl. 241-92.000.
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline film of zinc oxide and method for making same. 4,229,506, Cl. 428-539.000.
Nissan Chemical Industries Ltd.: *See*—
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, 4,229,552, Cl. 525-437.000.
Nissan Motor Company, Limited: *See*—
Arima, Tatsuhiro; and Yamanashi, Chusaku, 4,228,971, Cl. 242-107.600.
Kita, Toru, 4,228,768, Cl. 123-494.000.
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Nitto Boseki Co., Ltd.: *See*—
Coggin, Charles H., Jr.; and Jones, John L., Jr., 4,229,198, Cl. 65-11.00W.
Niveau AG: *See*—
Zerlauth, Hellmuth, 4,228,838, Cl. 152-216.000.
NL Industries, Inc.: *See*—
Cole, Donald G.; Hartmann, Achim; Kulling, Achim M.; and Trub, Hermann B., 4,229,399, Cl. 264-117.000.
Nobileau, Philippe C., to Vetco Inc. Floating platform well production apparatus. 4,228,857, Cl. 166-341.000.
Noesen, Stanley J.; and Baldwin, Fredrick M., to General Electric Company. Screw socket assembly device. 4,228,583, Cl. 29-747.000.
Noguchi, Isamu. Lampstand for lampshade. 4,229,784, Cl. 362-414.000.
Noguera, John M. Top arms for textile fibre roller. 4,228,564, Cl. 19-282.000.
Nohmi, Takashi; Yamada, Takao; and Doi, Yoshinao, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of separating oil from oil-containing liquid. 4,229,297, Cl. 210-654.000.
Nomura, Yasushi, to Citizen Watch Company Limited. Electronic timepiece equipped with alarm system. 4,228,645, Cl. 368-75.000.
Nonogaki, Masahiko, to Elmo Company Limited. Zoom lens assembly for photographic cameras. 4,229,074, Cl. 350-187.000.
Nordfeldt, Sven A.: *See*—
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Noren, Tore H. Low temperature conveyor, rack-type dishwasher. 4,228,813, Cl. 134-47.000.
Norlin Industries, Inc.: *See*—
Gross, Glenn, 4,228,713, Cl. 84-1.190.
Luce, David A., 4,228,717, Cl. 84-1.240.
Norman, Paula R., to Dow Chemical Company, The. Esterification process. 4,229,362, Cl. 260-410.600.
Norris Industries, Inc.: *See*—
Beisch, Hans R., 4,229,047, Cl. 301-37.00P.
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North American Philips Corporation: *See*—
Jenkins, Ronald, 4,229,499, Cl. 428-336.000.
Northern Telecom Limited: *See*—
Levi, Israel, 4,229,716, Cl. 333-28.00R.
Northwest Sanitation Products, Inc.: *See*—
Hocker, Harvey L.; and Alcamo, John M., 4,228,928, Cl. 222-181.000.
Noto, Takao: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Nourney, Carl-Ernst. Strain-gauge sound pickup for string instrument. 4,228,715, Cl. 84-1.160.
Nova Associates, Inc.: *See*—
Ryding, Geoffrey, 4,229,655, Cl. 250-400.000.
Noyelle, Andre: *See*—
Dreano, Claude; and Noyelle, Andre, 4,229,458, Cl. 426-264.000.
Nozaki, Kenzie, to Shell Oil Company. 1,7-Octadiene process. 4,229,605, Cl. 585-509.000.
Nozaki, Kenzie, to Shell Oil Company. 1,7-Octadiene process. 4,229,606, Cl. 585-509.000.
NSK-Warner K.K.: *See*—
Ikesue, Haruyuki; and Yamamoto, Kazuo, 4,228,567, Cl. 24-230.0AL.
Kikuchi, Kouichi, 4,228,829, Cl. 139-408.000.
Morinaga, Masaru, 4,228,970, Cl. 242-107.40A.
Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co., Ltd. 4-Hydroxy-3-(substitutedmethyl)-benzeneacetic acids. 4,229,363, Cl. 260-454.000.
Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co., Ltd. Indole cephalosporin derivatives. 4,229,574, Cl. 544-21.000.
Nyborg, George L., Jr., to Tri-County Elevator Co., Inc. Elevator door safety mechanism. 4,228,873, Cl. 187-61.000.
Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., to Gambro AB. Apparatus for the measuring of the concentration of low-molecular compounds in complex media. 4,229,542, Cl. 435-291.000.
Oba, Yoichi: *See*—
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.
Oberrecht, David A.; and Wilson, Fred A., to Dover Corporation. Swivel connector. 4,229,024, Cl. 285-98.000.
Occidental Petroleum Corporation: *See*—
Sass, Allan, 4,229,185, Cl. 48-197.00R.
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Oddo, Eugene P.: *See*—
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O'Donnell, Dennis: *See*—
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Heinrich, Hans J.; Oelbermann, Max; and Rademacher, Karl A., 4,229,303, Cl. 210-225.000.
Oeser, Heinz-Guenter; Koenig, Karl-Heinz; and Mangold, Dietrich, to BASF Aktiengesellschaft. Manufacture of substituted fluorobenzenes. 4,229,365, Cl. 260-465.00G.
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, to Agency of Industrial Science & Technology. Process for preparation of aldehydes. 4,229,381, Cl. 568-454.000.
Ogawa, Haruki: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Ogawa, Toshio: *See*—
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Ohkuma, Kazuhiko; Takagi, Hideo; Nakata, Akira; and Kosaka, Shogo, to Nippon Soda Company, Ltd. Cyanopyrrole derivatives. 4,229,465, Cl. 424-274.000.
Ohlschlager, Hans, to AGFA-Gevaert, A.G. Light-sensitive photographic recording material. 4,229,526, Cl. 430-583.000.
Ohmukai, Yoshimi; Tomisawa, Takeshi; and Kawasaki, Yoshitaka, to Matsushita Electric Industrial Co., Ltd. Combustion device for liquid fuels. 4,229,159, Cl. 431-328.000.
Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Fishing equipment. 4,228,612, Cl. 43-43.130.
Ohno, Nobuo: *See*—
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Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, to Konishiroku Photo Industry Co., Ltd. Method of undercoating treatment of polyester films for photographic light-sensitive materials. 4,229,523, Cl. 430-532.000.
Ohta, Takao, to Nintendo Co., Ltd. Light-emission gun amusement machine for home use. 4,229,009, Cl. 273-312.000.
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Penicillanic acid derivatives. 4,229,348, Cl. 260-239.100.
Okada, Motohiro, to Honda Giken Kogyo Kabushiki Kaisha. Safety wheel. 4,228,840, Cl. 152-400.000.
Okazaki, Hiroshi: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
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Specht, Steven J., 4,229,277, Cl. 204-252.000.
Winter, Joseph; Tyler, Derek E.; and Pryor, Michael J., 4,229,210, Cl. 75-10.00R.
Olinsky, Lester H., to Binney & Smith, Inc. Nib for a writing instrument. 4,229,115, Cl. 401-196.000.
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Vibration-absorbing antifriction bearing, especially for a driveshaft of a motor vehicle. 4,229,055, Cl. 308-26.000.
Olsen, Perry C., to RCA Corporation. Wire coil assembly for an electrical circuit. 4,229,722, Cl. 336-192.000.
Olshansky, Robert; and Sarkar, Arnab, to Corning Glass Works. High bandwidth optical waveguide having B_2O_3 free core and method of fabrication. 4,229,070, Cl. 350-96.310.
Olsson, Kjell I.; Aberg, Anders E. B.; and Gislen, Lars O. S. Method and means for measuring surface tension. 4,228,677, Cl. 73-64.400.
Olympus Optical Co., Ltd.: *See*—
Kimura, Tadashi, 4,229,087, Cl. 354-23.00R.
Omi, Kokichi: *See*—
Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, 4,229,085, Cl. 353-75.000.
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Onda, Eiichi: *See*—
Kitai, Kiyoshi; Onda, Eiichi; Yonemoto, Tomoo; and Nagaoka, Shinji, 4,229,089, Cl. 354-25.000.
Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; Onda, Eiichi; and Nemoto, Ichiro, 4,229,093, Cl. 354-266.000.
O'Neil, John B., to Exxon Research & Engineering Co. Thermoplastic twines. 4,228,641, Cl. 57-234.000.
O'Neill, Joseph C. Reinforced foundation structure. 4,228,627, Cl. 52-295.000.
Onisko, Bruce L.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,229,357, Cl. 260-397.200.

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Arai, Eisuke; Kamei, Kuniaki; Kawasaki, Akio; Takagi, Fumio; Shirai, Koichi; and Orihara, Yasuharu, 4,229,239, Cl. 156-155.000.
Orlov, Alexei A.: *See*—
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Lee, Henry L., Jr.; and Orlowski, Jan A., 4,229,431, Cl. 424-61.000.
Orr, Lawrence W., Jr.; and Ross, Edgar A., to Southern Weaving Company. Round/flat woven multi-conductor cable. 4,229,615, Cl. 174-117.00M.
Orthman, Henry K., to Orthman Manufacturing, Inc. Apparatus for synchronizing the steering disc and row follower means of a row crop implement. 4,228,860, Cl. 172-26.000.
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Orthman, Henry K., 4,228,860, Cl. 172-26.000.
Orths, Kurt; Prumbaum, Roland; and Berger, Peter, to Strohlein GmbH & Co. Apparatus for the determination of bond forms of gases. 4,229,412, Cl. 422-80.000.
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Osborne, Duncan W., to Automotive Products Limited. Internal shoe drum brakes. 4,228,876, Cl. 188-79.5GT.
Oshiro, Yasuo: *See*—
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Osmond, Desmond W. J.: *See*—
Dawson, David G.; Osmond, Desmond W. J.; Skinner, Maurice W.; and West, Edmund J., 4,229,224, Cl. 106-90.000.
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Otsuka Pharmaceutical Co., Ltd.: *See*—
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Otty, Malcolm. Method and apparatus for pressing and curing resin-impregnated wrappings about coils. 4,229,242, Cl. 156-245.000.
Oura, Maremi; Tsumura, Haruo; and Kubota, Hayato, to Fuji Oil Company, Ltd. Coloring matter for foods. 4,229,483, Cl. 426-250.000.
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Van Rens, Russell J., 4,229,151, Cl. 418-61.00A.
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Zeitter, Charles R.; and Thomas, John F., 4,228,898, Cl. 206-621.000.
Paglione, Robert W., to RCA Corporation. Temperature controller for a microwave heating system. 4,228,809, Cl. 128-804.000.
Paine, Joseph P.: *See*—
Kahn, Marvin J.; Malchodi, Robert J.; Paine, Joseph P.; Rogers, Milton J.; and Zouck, Robert L., 4,228,737, Cl. 102-3.000.
Palluel, Auguste L. L.: *See*—
Bentley, John; Thompson, Morice W.; and Palluel, Auguste L. L., 4,229,339, Cl. 260-34.200.
Palmer, Albion W., to Borg-Warner Corporation. Automatic wear adjuster for Belleville spring clutches. 4,228,883, Cl. 192-111.00A.
Palmieri, Louis W.: *See*—
Karbowski, Sylvester G., 4,228,710, Cl. 83-794.000.
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Karbowski, Sylvester G., 4,228,710, Cl. 83-794.000.
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Dixon, Guy E., 4,228,841, Cl. 160-183.000.
Panissidi, Hugo A., to International Business Machines Corporation. Programmable air pressure counterbalance system for a manipulator. 4,229,136, Cl. 414-673.000.
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Richmond, James A.; and Parent, Christopher A., 4,229,148, Cl. 417-485.000.
Parker, Alan J.; and Muir, David M., to Anumin Pty. Ltd. Recovery of copper from materials containing copper and acid soluble iron compounds. 4,229,212, Cl. 75-101.00R.
Parker, Roger A., to Richardson-Merrell Inc. Alkoxy benzofuran carboxylic acids and salts and esters thereof as hypolipidemic agents. 4,229,467, Cl. 424-285.000.
Parrish, Ernest H. Metal can crusher. 4,228,734, Cl. 100-245.000.
Parrotto, Joseph: *See*—
Frey, G. Robert; Parrotto, Joseph; and Fontaine, Francis X., 4,229,124, Cl. 405-303.000.
Parsons, David: *See*—
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Parsons, Samuel D.: *See*—
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Passerell, David P.: *See*—
Volgstadt, Frank R.; and Passerell, David P., 4,229,025, Cl. 285-105.000.
Patchornik, Abraham: *See*—
Nudelman, Abraham; and Patchornik, Abraham, 4,229,363, Cl. 260-454.000.
Nudelman, Abraham; and Patchornik, Abraham, 4,229,574, Cl. 544-21.000.
Paton, Neil E.; and Rhodes, Cecil G., to Rockwell International Corporation. Titanium base alloy. 4,229,216, Cl. 75-175.500.
Paul, Volker: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Paul, Volker, 4,229,459, Cl. 424-269.000.
Pawlowski, Eugene J. Miniature pneumatic switch actuator. 4,229,629, Cl. 200-82.00R.
Paxton & Vierling Steel Co.: *See*—
Bruner, Frank D., 4,228,741, Cl. 105-197.00D.
Payfer Laboratories Inc.: *See*—
Haynes, Robert W.; and Rasmussen, William H., 4,229,544, Cl. 435-253.000.
Payne, Shelley M.: *See*—
Finkelstein, Richard A.; and Payne, Shelley M., 4,229,530, Cl. 435-37.000.
Pearson, Frederick C., to Baxter Travenol Laboratories, Inc. In vitro cultivation of horseshoe crab amebocytes. 4,229,541, Cl. 435-241.000.
Peerless Pottery, Inc.: *See*—
Weaver, Charles S., Jr., 4,228,552, Cl. 52-35.000.
Pegels, Abraham A.: *See*—
Wijffels, Joannes B.; Pegels, Abraham A.; and Wezenberg, Arnold, 4,229,418, Cl. 422-191.000.
Peitsmeier, Karl; and Link, Manfred, to Daimler-Benz Aktiengesellschaft. Ignition lock unit with anti-theft protection. 4,229,062, Cl. 339-82.000.
Pellegata, Renato; and Gandolfi, Carmelo, to Farmitalia Carlo Erba. Fluoro-prostaglandins. 4,229,585, Cl. 560-55.000.
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico. 9-Deoxy-9,10-epoxide-daunomycinone. 4,229,355, Cl. 260-348.520.
Pennwalt Corporation: *See*—
Kulischenko, Walter, 4,228,760, Cl. 440-86.000.
Peoples, John T., to Bell Telephone Laboratories, Incorporated. Loop fault sectionalization. 4,229,626, Cl. 179-175.30F.
Perez-Alonso, Domingo. Safety latches for portfolios, bags, suitcases and the like. 4,228,666, Cl. 70-67.000.
Perez, Richard D. Pontic having an internal ceramic core. 4,229,170, Cl. 433-206.000.
Perfection Corporation: *See*—
Volgstadt, Frank R.; and Passerell, David P., 4,229,025, Cl. 285-105.000.
Performance Industries, Inc.: *See*—
Boyesen, Eyvind, 4,228,770, Cl. 123-73.00V.
Perry, James C., to General Motors Corporation. Air-operated spray device. 4,228,958, Cl. 239-411.000.
Persson, Anders E.: *See*—
Liljekvist, Bernt S.; and Persson, Anders E., 4,228,863, Cl. 175-344.000.
Persson, Ingemar P., to Nitro Nobel AB. Method of joining an inner metal pipe with an outer surrounding metal pipe. 4,228,941, Cl. 228-107.000.
Peters, Alan W.; Bowes, Emmerson; and Stein, Thomas R., to Mobil Oil Corporation. Catalytic dewaxing of hydrocarbon oils. 4,229,282, Cl. 208-111.000.
Petersen, Kurt E.: *See*—
Hartstein, Allan M.; and Petersen, Kurt E., 4,229,732, Cl. 340-378.200.
Petersen, Loyal F. Safety device for mobile irrigation assemblies. 4,228,955, Cl. 239-177.000.
Peterson, Paul G. Reinforced clothing component and method of making same. 4,228,547, Cl. 2-129.000.

Petocz, Lujza: *See—*
Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, 4,229,350, Cl. 260-243.300.

Petrak, Karel L., to Eastman Kodak Company. Polymers for use in dye image-receiving layers of image transfer film units. 4,229,515, Cl. 430-213.000.

Petrak, Karel L.: *See—*
Sharp, Gerald B.; Petrak, Karel L.; Boielle, John H.; Wagner, Hans M.; and Langford, John F., 4,229,519, Cl. 430-287.000.

Petri, Norbert: *See—*
Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, 4,229,590, Cl. 560-174.000.

Petro, John, to Westinghouse Electric Corp. Safety switch which renders HID lamp inoperative on accidental breakage of outer envelope. 4,229,678, Cl. 315-73.000.

Petrolite Corporation: *See—*
Cheng, William J.; and Guthrie, David B., 4,229,309, Cl. 252-25.000.
Redmore, Derek; and Welge, Frederick T., 4,229,294, Cl. 210-700.000.

Petrosky, Kenneth J.; and Wilson, James H., to Westinghouse Electric Corp. Magnetometer instrumentation with digitally controlled range changing. 4,229,697, Cl. 324-244.000.

Petrovich, Svyatoslav V.: *See—*
Sarkisov, Arutjun K.; and Petrovich, Svyatoslav V., 4,229,434, Cl. 424-88.000.

Pfahler, Gerhard: *See—*
Mayer, Norbert; Pfahler, Gerhard; Scheidl, Franz; and Wiezer, Hartmut, 4,229,382, Cl. 260-930.000.

Pfister, Jean-Claude: *See—*
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Pfizer Inc.: *See—*
Iversen, Arthur; and Magyar, John, 4,229,656, Cl. 250-447.000.

Phillips Petroleum Company: *See—*
Alquist, Henry E.; and Ammerman, Allen M., 4,229,281, Cl. 208-11.0LE.
Brinkmeyer, Francis M.; and Haskell, Donald M., 4,229,602, Cl. 585-407.000.
Childs, William V., 4,229,263, Cl. 203-44.000.
Cowling, Edgar C., 4,228,845, Cl. 165-1.000.
Hatcher, Charles S.; and Smith, Kenneth E., 4,229,404, Cl. 264-290.500.
Hutson, Thomas, Jr.; and Brinkmeyer, Francis M., 4,229,609, Cl. 585-660.000.
Louthan, Rector P., 4,229,588, Cl. 560-147.000.
Myers, John W.; and Montgomery, Dean P., 4,229,610, Cl. 585-664.000.

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Photon Power, Inc.: *See—*
Chamberlin, Rhodes R.; and Bigham, Herbert L., 4,228,570, Cl. 29-33.00R.

Piazza, Matthew R., to Maso-Therm Corporation. Composite module with reinforced shell. 4,229,497, Cl. 428-71.000.

Picarello, Joseph F., to Borg-Warner Corporation. Apparatus for reducing ice build-up on a discharge grill of a heat pump outdoor unit. 4,228,663, Cl. 62-507.000.

Piccardi, Paolo; and Longoni, Angelo, to Montedison S.p.A. Compounds having a trichloromethylic end group having a juvenile hormone action on insects and acaricide activity. 4,229,470, Cl. 424-304.000.

Pierantozzi, Gianni: *See—*
De Vivo, Alessandro; Pierantozzi, Gianni; Santarpia, Diodato; and Spolverini, Renzo, 4,228,557, Cl. 15-21.00E.

Pilz, Hans: *See—*
Wenzel, Franz; Schoedel, Ulrich; Jost, Heinz; and Pilz, Hans, 4,229,311, Cl. 252-50.000.

Pinckard, Joseph A., to Ekok Corporation, The. Method for the treatment of trees or shrubs affected with decline symptoms with treated cotton gin waste. 4,229,442, Cl. 424-195.000.

Pioneer Electronic Corporation: *See—*
Suganuma, Hisashi, 4,229,707, Cl. 330-277.000.

Pircon, Ladislav J. Pollution control apparatus and method. 4,229,189, Cl. 55-90.000.

Pirelli Furlanis—Applicazioni Idrauliche Agricole Gomma S.p.A.: *See—*
Borca, Bruno; and Calza, Francesco, 4,229,119, Cl. 405-96.000.

Pitney Bowes Inc.: *See—*
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Pitt Metals & Chemicals, Inc.: *See—*
Horn, Richard E., 4,229,280, Cl. 204-301.000.

Pitts, Robert W., Jr.; and Gillespie, Ronald G., to Texaco Inc. Facsimile system. 4,229,769, Cl. 358-285.000.

Pizzocri, Guido: *See—*
Trevisson, Renato; and Pizzocri, Guido, 4,228,695, Cl. 74-492.000.

Platt Saco Lowell Limited: *See—*
Dakin, John; O'Donnell, Dennis; and Copple, Christopher J., 4,228,642, Cl. 57-263.000.
Wild, Gerald, 4,229,285, Cl. 209-3.000.

Plattner, Werner, administrator: *See—*
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.

Plett, Carl E., to Dairy Systems, Inc. Milking unit support and detacher mechanism. 4,228,764, Cl. 119-14.080.

Plumb, John L., to GTE Products Corporation. Frequency/sensitive switching circuit. 4,229,681, Cl. 315-244.000.

Plummer, Derek, to Coal Industry (Patents) Limited. Excavating machines. 4,229,042, Cl. 299-18.000.

Pocklington, Terence W., to Colgate-Palmolive Company. Method of making golf balls. 4,229,401, Cl. 264-248.000.

Pohl, Ludwig: *See—*
Krause, Joachim; Eidenschink, Rudolf; and Pohl, Ludwig, 4,229,315, Cl. 252-299.000.

Pola Chemical Industries, Inc: *See—*
Miyao, Kohei; Ito, Yoshitaka; and Wachi, Tsuneo, 4,229,468, Cl. 424-287.000.

Polansky, Josef: *See—*
Klabacka, Bedrich; Polansky, Josef; and Hynek, Josef, 4,229,334, Cl. 260-28.50A.

Polaroid Corporation: *See—*
Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., 4,229,090, Cl. 354-86.000.
Wray, William R., 4,229,083, Cl. 352-14.000.

Polataiko, Roman I.: *See—*
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Poletto, John F.: *See—*
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Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,229,372, Cl. 260-507.00R.

Pollock, Richard, to Borg-Warner Corporation. Method for preparing an embossed foamed latex sheet. 4,229,406, Cl. 264-321.000.

Polonsky, Jury Z.: *See—*
Anichkov, Andrei D.; Polonsky, Jury Z.; and Usov, Vladimir V., 4,228,799, Cl. 128-303.00B.

Ponomarev, Viktor A.: *See—*
Alt, Viktor V.; Mischenkov, Alexandr A.; Ponomarev, Viktor A.; Avdjushev, Eduard L.; Kamynin, Jury S.; Baryshnikov, Vladimir P.; Levin, Grigory K.; and Orlov, Alexei A., 4,228,679, Cl. 73-117.300.

Ponpipom, Mitree M.: *See—*
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Popek, Stephen: *See—*
Chalmers, Alexander A.; Gailey, J. Lynn; Englund, James A.; and Popek, Stephen, 4,228,629, Cl. 52-460.000.

Porceny Co., Ltd.: *See—*
Kikuchi, Makoto; and Yamada, Keijyu, 4,229,167, Cl. 433-74.000.

Porter, William R., to American Home Products Corporation. Intraoral methods of using benzodiazepines. 4,229,447, Cl. 424-244.000.

Post Office, The: *See—*
Cochrane, Peter, 4,229,622, Cl. 370-81.000.

Potter, David: *See—*
Levy, John V.; Rodgers, David; Stewart, Robert E.; Potter, David; and Casabona, Richard J., 4,229,791, Cl. 364-200.000.

Potter, Michael B., to Seetru Limited. Valve arrangement. 4,228,987, Cl. 251-210.000.

PPG Industries, Inc.: *See—*
Carlblom, Leland H., 4,229,274, Cl. 204-159.150.
Cathers, William P., 4,228,993, Cl. 271-236.000.
Comperatore, John A.; Black, Edward D.; and Wise, David J., 4,229,201, Cl. 65-287.000.
Franklin, Kenneth; Rosenthal, William S.; and Greer, S. Thomas, 4,228,893, Cl. 206-205.000.
Moran, Raymond D., 4,228,886, Cl. 198-395.000.
Seymour, Samuel L., 4,229,199, Cl. 65-106.000.
Seymour, Samuel L., 4,229,200, Cl. 65-106.000.

PREMA GmbH: *See—*
Marti, Karl, 4,228,812, Cl. 133-3.00F.

Prengaman, Raymond D.; and McDonald, Herschel B., to RSR Corporation. Method of recovering lead values from battery sludge. 4,229,271, Cl. 204-114.000.

Price, Frank B.; and Vertenstein, Mathieu J., to Silver Engineering Works, Inc. Electroplating electrode and method of mounting an article to be plated thereon. 4,229,279, Cl. 204-297.00R.

Prince Corporation: *See—*
Marcus, Konrad H., 4,229,724, Cl. 340-23.000.

Pringle, William L., to United States Steel Corporation. Heat exchanger assembly. 4,228,572, Cl. 29-157.30R.

Pringle, William L., to Friedman, Leonard. Bonding fixture. 4,229,245, Cl. 156-382.000.

Procter & Gamble Company, The: *See—*
Crawford, Robert J., 4,229,364, Cl. 260-464.000.
Whitehouse, Harry S., 4,229,427, Cl. 424-1.000.

Procter, James W., to Ravenhead Brick Company Limited. Process for the manufacturing of colored clay products. 4,229,391, Cl. 264-29.500.

Prosen, Emil M., to Neoloy Products, Inc. Non-precious stainless dental alloy. 4,229,215, Cl. 75-134.00C.

Pruex, Roger. Crane load computer. 4,228,681, Cl. 73-133.00R.

Prumbaum, Roland: *See—*
Orths, Kurt; Prumbaum, Roland; and Berger, Peter, 4,229,412, Cl. 422-80.000.

Pryor, Michael J.: *See—*
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Przybylinski, Phillip G.; and Morgan, Terry B., to Pullman Incorporated. Railway car integral hopper structure. 4,228,742, Cl. 105-248.000.

Pucher, Janos; and Schmider, Antal, to "NIKEX" Nehezipari Kulkereskedelmi Vallalat. Method of and apparatus for transporting fluid substances. 4,229,143, Cl. 417-53.000.

Puddington, Ira E.: *See—*
Caswell, Bruce F.; and Puddington, Ira E., 4,229,293, Cl. 210-727.000.

Pugliese, Antonio, to Industrial Pugliese, Inc. Needle positioning attachment for sewing machine. 4,228,749, Cl. 112-274.000.

Pullman Incorporated: *See—*
Przybylinski, Phillip G.; and Morgan, Terry B., 4,228,742, Cl. 105-248.000.

Purdue Research Foundation: *See—*
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Purex Corporation: *See—*
Barrett, John H.; and Flynn, Brian P., 4,229,475, Cl. 428-196.000.

Purification Sciences Inc.: *See—*
Lowther, Frank E., 4,228,659, Cl. 60-68.00Z.

Quattrone, Francesco: *See—*
Vigano, Carlo; Quattrone, Francesco; and Toffanetti, Erio, 4,229,645, Cl. 235-92.0QC.

Qvarnstrom, Lars A. G.: *See—*
Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,229,542, Cl. 435-291.000.

R.T.M.-Istituto per le Ricerche di Tecnologia Meccanica: *See—*
Castellani Longo, Massimo, 4,229,640, Cl. 219-121.0LJ.

Rabe, David L.; Hudson, Colin M.; and Soteropulos, Gust, to Deere & Company. Preservative applicator for a round baler. 4,228,638, Cl. 56-341.000.

Rabus, Friedrich; and Grather, Gunter, to Robert Bosch GmbH. Extended spark capacitor discharge ignition system. 4,228,778, Cl. 123-605.000.

Raczuk, Richard C. Muffler apparatus. 4,228,868, Cl. 181-247.000.

Rademacher, Karl A.: *See—*
Heinrich, Hans J.; Oelbermann, Max; and Rademacher, Karl A., 4,229,303, Cl. 210-225.000.

Radman, Anton J., Jr.: *See—*
Janssen, Donovan M.; Radman, Anton J., Jr.; and Seaward, William S., 4,229,774, Cl. 360-98.000.

Rahgo, George P.: *See—*
Bujese, David P.; and Rahgo, George P., 4,229,096, Cl. 355-14.0CU.

Raj, Ghen M. G. Compact low surface area dialyzer method and apparatus. 4,229,290, Cl. 210-646.000.

Raman, Ramaswamy V.: *See—*
Witt, August F.; and Raman, Ramaswamy V., 4,229,231, Cl. 148-1.500.

Ramey, Carol a/k/a Carali. Pressure-switch operated vibrating unit. 4,228,793, Cl. 128-33.000.

Ramig, Robert J., Jr.: *See—*
Bellino, Joseph A.; Feldy, Edmund C.; LaSpesa, Richard E.; and Ramig, Robert J., Jr., 4,229,617, Cl. 178-92.000.

Ramirez, Peter R.: *See—*
Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., 4,229,228, Cl. 106-287.140.

Rampel, Hans; Hess, Peter; and Schulz, Volkmar, to Metallwerk Max Brose GmbH & Co. Adjusting mechanism for the seat of an automotive vehicle. 4,228,981, Cl. 248-430.000.

Ramsey, James B.: *See—*
Ramsey, Richard R.; and Ramsey, James B., 4,229,015, Cl. 280-819.000.

Ramsey, Richard R.; and Ramsey, James B. Ski pole adapted to contain a liquid. 4,229,015, Cl. 280-819.000.

Rancourt, James D.; and Beauchamp, William T., to Optical Coating Laboratory, Inc. Visible transmitting and infrared reflecting filter. 4,229,066, Cl. 350-1.600.

Rand, Roger. Recreational vehicle sewer hose support. 4,228,978, Cl. 248-49.000.

Rao, Tadikonda N.: *See—*
Derby, Jeffrey H.; and Rao, Tadikonda N., 4,229,625, Cl. 179-170.00R.

Rappold, Franz: *See—*
Koy, Johannes; Rappold, Franz; and Kappelsberger, Erwin, 4,229,639, Cl. 219-121.0EM.

Rasmussen, Chris R., to McNeilab, Inc. Method for controlling hypertension and compositions. 4,229,462, Cl. 424-273.00R.

Rasmussen, Ole-Bendt. Multi-layer products. 4,229,394, Cl. 264-46.100.

Rasmussen, William H.: *See—*
Haynes, Robert W.; and Rasmussen, William H., 4,229,544, Cl. 435-253.000.

Rauth, Michael: *See—*
Burkhardt, Horst; Schwefel, Ernst; Baumgartner, Alfons; Mayer, Anton; and Rauth, Michael, 4,229,646, Cl. 235-92.0GC.

Ravenhead Brick Company Limited: *See—*
Procter, James W., 4,229,391, Cl. 264-29.500.

Raychem Corporation: *See—*
Dahl, Klaus J., 4,229,564, Cl. 528-175.000.
Glover, Leon C.; and Lopez, Eugene F., 4,228,761, Cl. 116-201.000.

Raynor, Harold M.: *See—*
Deaton, Willis R.; Clark, John I., Jr.; and Raynor, Harold M., 4,229,726, Cl. 340-38.00R.

Raytheon Company: *See—*
Dorschner, Terry A.; Smith, Irl W., Jr.; and Statz, Hermann, 4,229,106, Cl. 356-350.000.
Krilanovich, Nicholas J., 4,229,740, Cl. 343-113.00R.
Tancrell, Roger H., 4,228,686, Cl. 73-626.000.

RCA Corporation: *See—*
Avery, Leslie R., 4,229,760, Cl. 358-22.000.
Demers, Robert R.; and Leedom, Marvin A., 4,228,782, Cl. 125-14.000.
Harwood, Leopold A.; and Wittmann, Erwin J., 4,229,759, Cl. 358-19.000.
Olsen, Perry C., 4,229,722, Cl. 336-192.000.
Paglione, Robert W., 4,228,809, Cl. 128-804.000.
Rosen, Arye; and Santamore, William P., 4,228,805, Cl. 128-691.000.
Thibodeau, Leslie N., 4,229,787, Cl. 363-126.000.
Tocci, Anthony J., 4,228,937, Cl. 225-96.500.
Wu, Chung P.; and Smeltzer, Ronald K., 4,229,502, Cl. 428-446.000.
Yu, John P., 4,229,714, Cl. 333-12.000.

Re, Thomas W.: *See—*
Arvanitis, Aristotelis S.; Re, Thomas W.; and Malinowski, Stanley, 4,229,718, Cl. 333-192.000.

Reale, Lucio V. Process for recovering viscous, combustible material. 4,228,856, Cl. 166-256.000.

Recognition Equipment Inc.: *See—*
Ingram, James R., Jr.; and Kiesel, George A., 4,228,953, Cl. 235-480.000.

Redcom Laboratories, Inc.: *See—*
Breidenstein, Charles J.; Caplan, Jerome S.; and Littlefield, Bruce G., 4,229,816, Cl. 370-100.000.

Reddy, Kadiri R.: *See—*
Gregorian, Roubik; and Reddy, Kadiri R., 4,229,800, Cl. 364-745.000.

Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Hydroxypropylene-amino-phosphonic-sulfonic acids for inhibiting scale formation. 4,229,294, Cl. 210-700.000.

Reed, Denvil E.; and Grimm, Richard C., to Union Carbide Corporation. Process for separating alkoxyketone compounds from the corresponding 1-alkoxy-2-alkanol compound. 4,229,262, Cl. 203-29.000.

Rees, James D.: *See—*
Lenhard, Myron J.; Rees, James D.; and Xerox Corporation, 4,229,512, Cl. 430-106.000.

Reformatsky, Igor A.: *See—*
Motin, Jury D.; Reformatsky, Igor A.; Sinitsyn, Pavel R.; Ivanov, Nikolai M.; Malakhov, Igor K.; and Ivanov, Boris I., 4,229,069, Cl. 350-96.290.

Reichel, Richard C.: *See—*
Lazar, Remus I.; and Reichel, Richard C., 4,229,177, Cl. 8-435.000.
Lazar, Remus I.; and Reichel, Richard C., 4,229,178, Cl. 8-583.000.

Reilly, Richard J. Wind shear warning system for aircraft. 4,229,725, Cl. 340-27.0SS.

Reist, Walter, to Ferag AG. Apparatus for displacing three dimensional articles, especially stacks of printed products. 4,229,134, Cl. 414-46.000.

Reittu, Osmo: *See—*
Antikainen, Veijo; and Reittu, Osmo, 4,229,776, Cl. 361-283.000.

Reitz, Werner: *See—*
Huber, Lothar; and Reitz, Werner, 4,228,882, Cl. 192-98.000.

Reliable Automatic Sprinkler Co., The: *See—*
Sclafani, Joseph R., 4,228,858, Cl. 169-41.000.

Reliance Electric Company: *See—*
Michels, Charles E., 4,228,884, Cl. 192-135.000.

Rembold, Helmut: *See—*
Linder, Ernst; Rembold, Helmut; Teegen, Walter; Kessler, Achill; and Ehmann, Roland, 4,229,147, Cl. 417-283.000.

Reneault, Patrick; and Ovaert, Francis, to SMAC ACIEROID. Heat-sound insulating wall. 4,228,624, Cl. 52-145.000.

Renk, Richard J., to Miller, Gladys D. Bearings (bearing thrust lubrication). 4,229,056, Cl. 308-99.000.

Rennco Incorporated: *See—*
Swope, Jack G., 4,229,244, Cl. 156-358.000.

Restaurant Technology, Inc.: *See—*
Schindler, James C.; and Kroll, Steve, 4,228,730, Cl. 99-329.00R.

Revoil, Louis: *See—*
Bensahel, Daniel; Pfister, Jean-Claude; and Revoil, Louis, 4,229,237, Cl. 148-190.000.

Rhodes, Cecil G.: *See—*
Paton, Neil E.; and Rhodes, Cecil G., 4,229,216, Cl. 75-175.500.

Rhodes, Clifford C., to Texas Instruments Incorporated. I^2L Full adder and ALU. 4,229,803, Cl. 364-787.000.

Rhone-Poulenc Industries: *See—*
Brulet, Daniel; and Chauvel, Bernard, 4,229,308, Cl. 252-47.000.
Mirabel, Bernard, 4,229,342, Cl. 260-120.000.

Rhys-Davies, Noel C. Exsanguinating device for displacing blood from a limb by compression. 4,228,792, Cl. 128-24.300.

Richardson Chemical Company: *See—*
Steinecker, Carl, 4,229,267, Cl. 204-55.00R.

Richardson-Merrell Inc.: *See—*
Bohme, Ekkehard H., 4,229,575, Cl. 544-27.000.
Parker, Roger A., 4,229,467, Cl. 424-285.000.

Richey, Clarence B.; Parsons, Samuel D.; Lechtenberg, Victor L.; and Holt, Donald A., to Purdue Research Foundation. Compressible material treating device. 4,228,637, Cl. 56-341.000.

Richmond, James A.; and Parent, Christopher A., to Ambac Industries, Incorporated. Fuel injection pump. 4,229,148, Cl. 417-485.000.

Richter, Fred T.: *See*—
Gellatly, John S; and Richter, Fred T., 4,229,155, Cl. 425-114.000.

Rickards, Anthony F., to Credit du Nord International N.V. Physiologically adaptive cardiac pacemaker. 4,228,803, Cl. 128-419.0PG.

Ricke, Jack L.: *See*—
Stewart, Don S. D.; and Ricke, Jack L., 4,228,702, Cl. 76-36.000.

Ricoh Company, Ltd.: *See*—
Katoh, Tatuya, 4,229,511, Cl. 430-55.000.
Namiki, Ryoichi; and Hayashi, Yasuro, 4,229,644, Cl. 219-469.000.
Suzuki, Takami; Iwata, Nobuo; and Tsunasawa, Masami, 4,228,577, Cl. 29-418.000.

Riddle, Eldred O.: *See*—
Moore, Edward R.; and Riddle, Eldred O., 4,228,810, Cl. 132-7.000.

Ridgway, Frederick A.: *See*—
Lowe, Edward J.; and Ridgway, Frederick A., 4,229,307, Cl. 250-543.000.

Rieter Machine Works Ltd.: *See*—
Weber, Kurt, 4,228,563, Cl. 19-159.00R.

Rife, Orin S. Tire and tool carrier. 4,228,936, Cl. 224-42.230.

Ring, Thomas F., to Emhart Industries, Inc. Drive and clutch for a timing mechanism. 4,228,690, Cl. 74-122.000.

Rinker, Kurt H.; and Evans, Anthony C., to Kelsey Hayes Co. Hydraulic disc brake piston seal. 4,228,726, Cl. 92-168.000.

Rischawy, Dorothea Wilfert nee, legar heir: *See*—
Schmid, Walter; Wilfert, Karl, deceased; and Wilfert, Thomas, legal heir, 4,229,021, Cl. 280-787.000.

Risdon Corporation: *See*—
Snyder, George R., 4,228,569, Cl. 24-252.00R.

Rispoli, John L. Deodorizer footwear. 4,228,549, Cl. 2-239.000.

Ritter, Ernst; Trui, Josef; and Kramer, Manfred, to Robert Bosch GmbH. Control apparatus for supercharged fuel injection engines. 4,228,774, Cl. 123-562.000.

Rittscher, Dieter: *See*—
Baatz, Henning; and Rittscher, Dieter, 4,229,316, Cl. 252-301.10W.

Robert Bosch GmbH: *See*—
Engel, Gerhard; and Wessel, Wolf, 4,228,680, Cl. 73-119.00A.
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, 4,228,700, Cl. 74-866.000.
Forster, Herbert; and Bayer, Dieter, 4,229,476, Cl. 428-201.000.
Heinz, Richard; and Heidel, Bernd, 4,229,771, Cl. 360-46.000.
Linder, Ernst; Rembold, Helmut; Teegen, Walter; Kessler, Achill; and Ehmann, Roland, 4,229,147, Cl. 417-283.000.
Rabus, Friedrich; and Grather, Gunter, 4,228,778, Cl. 123-605.000.
Ritter, Ernst; Trui, Josef; and Kramer, Manfred, 4,228,774, Cl. 123-562.000.
Stumpp, Gerhard; and Schielinsky, Gerhard, 4,228,773, Cl. 123-505.000.

Roberts, Raymond, to Hawker Siddeley Bracket Limited. Mechanically raked bar screen. 4,229,301, Cl. 210-159.000.

Robertshaw Controls Company: *See*—
Weaver, Marvin P., 4,228,817, Cl. 137-79.000.

Robertson, Calvin A.: *See*—
Robertson, Larry M.; and Robertson, Calvin A., 4,228,751, Cl. 114-66.000.

Robertson, Larry M.; and Robertson, Calvin A. Underwater viewing apparatus. 4,228,751, Cl. 114-66.000.

Robinson, Carleton D.; and Debrauwere, Jack J. A., to Baxter Travenol Laboratories, Inc. Breakaway cap for solution containers. 4,228,835, Cl. 150-8.000.

Robnett, James H. Orthodontic method and means. 4,229,164, Cl. 433-20.000.

Rockwell International Corporation: *See*—
Custode, Frank Z., 4,229,755, Cl. 357-41.000.
Eshghy, Siavash, 4,228,576, Cl. 29-407.000.
French, Barry T., 4,229,754, Cl. 357-30.000.
Heimbigner, Gary L.; and Booher, Robert K., 4,229,667, Cl. 307-297.000.
Kruse, John M.; and Gelnett, Leland E., 4,228,819, Cl. 137-489.000.
Paton, Neil E.; and Rhodes, Cecil G., 4,229,216, Cl. 75-175.500.
Williams, Ernest E.; and Brennan, William M., 4,229,778, Cl. 361-399.000.

Roder, Albert: *See*—
Michal, Gerhard; Laube, Rolf; Roder, Albert; and Schneider, Walter, 4,229,529, Cl. 435-26.000.

Rodgers, David: *See*—
Levy, John V.; Rodgers, David; Stewart, Robert E.; Potter, David; and Casabona, Richard J., 4,229,791, Cl. 364-200.000.

Roehrick, Otto A. Ecolarium aquarium filler. 4,228,833, Cl. 141-340.000.

Roesch, Egon: *See*—
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.

Rogers, Milton J.: *See*—
Kahn, Marvin J.; Malchodi, Robert J.; Paine, Joseph P.; Rogers, Milton J.; and Zouck, Robert L., 4,228,737, Cl. 102-3.000.

Rogerson, Jerry B.; Connin, Robert F.; and Benedix, Harold E., Jr., to Ford Motor Company. Carburetor fuel flow control valve assembly. 4,229,387, Cl. 261-66.000.

Rogier, Edgar R., to Henkel Corporation. Polycyclic polyamines. 4,229,376, Cl. 260-563.00P.

Rogier, Edgar R., to Henkel Corporation. Polyurethanes based on high molecular weight formyl alcohols. 4,229,562, Cl. 528-85.000.

Rogovin, Zakhar A.: *See*—
Morin, Boris P.; Voinova, Galina J.; Breusova, Irina P.; Stanchenko, Galina I.; and Rogovin, Zakhar A., 4,229,326, Cl. 260-8.000.

Rohco, Inc.: *See*—
Lowery, Richard K.; and Starinshak, Thomas W., 4,229,268, Cl. 204-55.00R.

Rohm GmbH: *See*—
Wenzel, Franz; Schoedel, Ulrich; Jost, Heinz; and Pilz, Hans, 4,229,311, Cl. 252-50.000.

Rolls-Royce Limited: *See*—
Dinsdale, Raymond, 4,229,635, Cl. 219-69.00G.
Mullins, John A., 4,228,651, Cl. 60-226.00A.

Rolls-Royce (1971) Ltd.: *See*—
Scott, Alexander, 4,229,140, Cl. 416-97.00R.

Roman, Michael P. Therapeutic exercise device. 4,229,001, Cl. 272-96.000.

Ronco, Karl: *See*—
Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, 4,229,344, Cl. 260-157.000.

Roscher, Gunter: *See*—
Heck, Gunter; Roscher, Gunter; and Donth, Rudolf, 4,229,261, Cl. 203-14.000.

Rose, Donald K.: *See*—
Silverman, Peter J.; and Rose, Donald K., 4,229,248, Cl. 156-653.000.

Rosen, Arye; and Santamore, William P., to RCA Corporation. Method of measuring blood perfusion. 4,228,805, Cl. 128-691.000.

Rosenthal, William S.: *See*—
Franklin, Kenneth; Rosenthal, William S.; and Greer, S. Thomas, 4,228,893, Cl. 206-205.000.

Rosenzweig, William, to Fashion Ribbon Company Inc. Textile article. 4,228,954, Cl. 239-60.000.

Rosie, Aeneas M.; and Macleod, Colin J., to McDermott, Alistair Francis. Liquid storage tank contents gauge. 4,229,798, Cl. 364-564.000.

Ross, Edgar A.: *See*—
Orr, Lawrence W., Jr.; and Ross, Edgar A., 4,229,615, Cl. 174-117.00M.

Ross, Karl-Heinz: *See*—
Dudeck, Christian; Lehmann, Gunter; Meissner, Bernd; Diem, Hans; Fliege, Werner; Petri, Norbert; and Ross, Karl-Heinz, 4,229,590, Cl. 560-174.000.

Rossi, Alessandro: *See*—
Melloni, Piero; Torre, Arturo D.; Carniel, Giovanni C.; and Rossi, Alessandro, 4,229,449, Cl. 424-248.580.

Rostron, Joseph R., to Electric Power Research Institute, Inc. Gas puffer type current interrupter and method. 4,229,627, Cl. 200-144.00R.

Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., to American Optical Corporation. Coating composition. 4,229,228, Cl. 106-287.140.

Roth, Hermann J.; Eger, Kurt; Issa, Sedika; and Jacobi, Haireddin, to Bayer Aktiengesellschaft. Substituted 5,6-dimethylpyrrolo[2,3-d]pyrimidine compounds, their production and their medicinal use. 4,229,453, Cl. 424-251.000.

Rotunda, Orlando. Cubicle Quad antenna. 4,229,742, Cl. 343-742.000.

Roueche, Armand: *See*—
Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, 4,229,344, Cl. 260-157.000.

Rougeot, Henri, to Thomson-CSF. Semiconductor display apparatus. 4,229,736, Cl. 340-782.000.

Rozsa, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; Kiszelly, Eniko; and Nagy, Jozsef, to Egyt Gyogyszervegyeszeti Gyar. Dibenzo[d,g][1,3,6]dioxazocine derivatives. 4,229,350, Cl. 260-243.300.

RSR Corporation: *See*—
Prengaman, Raymond D.; and McDonald, Herschel B., 4,229,271, Cl. 204-114.000.

Ruehmann, Donald W.: *See*—
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,229,634, Cl. 200-302.000.

Ruffer, Dittmar; and Wagner, Edmund. Construction system. 4,228,625, Cl. 52-223.00R.

Ruscitti, Tommaso; Albini, Giovanni; and Torretta, Roberto, to ADM S.p.A. Manually operated pump for dispensing micronized liquids at a predetermined pressure. 4,228,931, Cl. 222-321.000.

Rusznak, Istvan: *See*—
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,229,366, Cl. 260-465.00F.

Rutenberg, Morton W.: *See*—
Chiu, Chung W.; and Rutenberg, Morton W., 4,229,489, Cl. 426-578.000.

Ruud, Alan J.; and Lewin, Ian, to McGraw-Edison Company. High efficiency lighting units with beam cut-off angle. 4,229,782, Cl. 362-297.000.

Ryan, John O., to Ampex Corporation. Beam control circuit for diode-gun type camera tubes. 4,229,767, Cl. 358-219.000.

Ryan, John O., to Ampex Corporation. Apparatus and method for providing a modulation format for multiple wideband signal transmission. 4,229,830, Cl. 455-608.000.

Ryding, Geoffrey, to Nova Associates, Inc. Vacuum chamber for treating workpieces with beams. 4,229,655, Cl. 250-400.000.
S&C Electric Company: *See—*
Guleserian, John E., 4,229,403, Cl. 264-263.000.
Tobin, Thomas J., 4,229,723, Cl. 337-275.000.
Sachitano, Jack: *See—*
Sato, Shuichi; Yamaguchi, Tadanori; and Sachitano, Jack, 4,229,756, Cl. 357-42.000.
Sacuta, Aleksy, to Alberta Research Council. Enhanced oil recovery using electrical means. 4,228,854, Cl. 166-248.000.
Saglini, Marco; and Meier, Walter, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Method and apparatus for time-optimized positioning of at least one body in a desired target position. 4,229,684, Cl. 318-561.000.
Saida, Takeshi: *See—*
Watarai, Syu; Sawada, Kenichi; and Saida, Takeshi, 4,229,510, Cl. 430-38.000.
Sailing Systems, Inc.: *See—*
Storer, John E., Jr., 4,228,756, Cl. 114-144.00R.
St. Laurent, Wilfred H., Jr., to Bellofram Corporation. Self-aligning shaft seal. 4,229,010, Cl. 277-30.000.
Saito, Kazuhisa: *See—*
Fukuta, Kenji; Ono-Oka, Ryuzo; Yoshida, Masatoshi; Saito, Kazuhisa; and Kosuda, Hiroyuki, 4,229,397, Cl. 264-113.000.
Saito, Yasunori, to Sumitomo Electric Industries, Ltd. Process for manufacturing coaxial cable. 4,229,238, Cl. 156-50.000.
Sakaguchi, Shinji: *See—*
Nakamura, Shigeru; Shimamura, Isao; Nakamura, Taku; Sakaguchi, Shinji; Miyazako, Takushi; Sugiysma, Masatoshi; and Mitsui, Akio, 4,229,522, Cl. 430-390.000.
Sakakiyama, Takashi: *See—*
Kai, Tamotsu; Tsurumi, Michio; Sakakiyama, Takashi; and Horiuchi, Kunihiro, 4,229,507, Cl. 428-541.000.
Sakamoto, Hitoshi, to Sony Corporation. Video signal recording system with automatic head positioning. 4,229,773, Cl. 360-70.000.
Sakuma, Akira: *See—*
Ichikawa, Atsushi; Tomita, Kenkichi; Horiuchi, Taku; Suzuki, Shin-ichi; and Sakuma, Akira, 4,229,471, Cl. 424-320.000.
Sakurai, Hajime; and Higuchi, Yoshinori, to Shin Meiwa Industry Co., Ltd. Automatic welding apparatus for long workpieces. 4,229,642, Cl. 219-125.100.
Salem, Robert J., to General Electric Company. Intrusion detection method and apparatus. 4,229,811, Cl. 367-93.000.
Salkind, Henry. Distal urinary replacement prosthesis. 4,228,550, Cl. 3-1.000.
Salmon, Douglas: *See—*
Bell, Roy L.; Garner, James B.; and Salmon, Douglas, 4,229,043, Cl. 299-33.000.
Salom, Jacques: *See—*
Berger, Guy F.; and Salom, Jacques, 4,228,864, Cl. 177-145.000.
Sampson, Stephen R.: *See—*
Heldwein, Carl A.; Jekel, Richard N.; Sampson, Stephen R.; and Zupan, John T., 4,229,737, Cl. 343-6.00R.
Samuel Strapping Systems Limited: *See—*
Heath, James E., 4,229,236, Cl. 148-128.000.
Sanderson, Roger S. Sterilized storage container. 4,228,914, Cl. 220-203.000.
Sandoz, Inc.: *See—*
Kathawala, Faizulla G., 4,229,463, Cl. 424-274.000.
Sandoz Ltd.: *See—*
Baumann, Hans-Peter; Karmann, Hans-Georg; and Wiedemann, Achim, 4,229,172, Cl. 8-533.000.
Fehr, Theodor; and Stadler, Paul, 4,229,451, Cl. 424-250.000.
Sandvik Aktiebolag: *See—*
Liljekvist, Bernt S.; and Persson, Anders E., 4,228,863, Cl. 175-344.000.
Sanger, Winston D. Remote audio and brightness control circuit for television. 4,229,765, Cl. 358-188.000.
Sanitary Scale Company: *See—*
Foster, Colin E., 4,229,794, Cl. 364-466.000.
Sano, Kozo; Kiga, Hidetaka; and Ikarashi, Takeo, to Mitsubishi Gas Chemical Company, Inc. Process for producing dimethyl formamide. 4,229,373, Cl. 260-561.00R.
Sansui Electric Co., Ltd.: *See—*
Takahashi, Susumu; and Chikashige, Tadaaki, 4,229,705, Cl. 330-258.000.
Santamore, William P.: *See—*
Rosen, Arye; and Santamore, William P., 4,228,805, Cl. 128-691.000.
Santarpia, Diodato: *See—*
De Vivo, Alessandro; Pierantozzi, Gianni; Santarpia, Diodato; and Spolverini, Renzo, 4,228,557, Cl. 15-21.00E.
Saphirwerk Industrieprodukte AG: *See—*
Stark, Karl, 4,228,821, Cl. 137-533.110.
Sarkar, Arnab: *See—*
Olshansky, Robert; and Sarkar, Arnab, 4,229,070, Cl. 350-96.310.
Sarkisov, Arutjun K.; and Petrovich, Svyatoslav V., to Vsesojuzny Institut Experimentalnoi Veterinarii. Vaccine for prophylaxis of trichophytosis in horse and method of preparing same. 4,229,434, Cl. 424-88.000.
Sasaki Electric Manufac. Co. Ltd.: *See—*
Hitora, Shozo, 4,229,781, Cl. 362-274.000.
Sasaki, Kuniaki: *See—*
Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, 4,229,440, Cl. 424-180.000.
Sass, Allan, to Occidental Petroleum Corporation. Process for the gasification of carbonaceous materials. 4,229,185, Cl. 48-197.00R.
Sato, Hideaki: *See—*
Tsuji, Takao; Goshima, Takeshi; and Sato, Hideaki, 4,229,763, Cl. 358-128.500.
Sato, Hiromitsu: *See—*
Shimano, Takashi; Masukata, Yoshimasa; and Sato, Hiromitsu, 4,229,392, Cl. 264-40.100.
Sato, Shuichi; Yamaguchi, Tadanori; and Sachitano, Jack, to Tektronix, Inc. Ultra high speed complementary MOS device. 4,229,756, Cl. 357-42.000.
Sattlegger, Hans; Schmidt, Hermann; and Schnurrbusch, Karl, to Bayer Aktiengesellschaft. Process for the preparation of organopolysiloxane moulding compositions which give fine-pored elastomeric foam mouldings. 4,229,548, Cl. 521-110.000.
Savit, Joseph, to AES Technology Systems, Inc. Envelope opening process and composition. 4,228,634, Cl. 53-492.000.
Savitz, Steven R.; and Drago, James A., to Hoechst Aktiengesellschaft. Peristaltic dialysate solution pump. 4,229,299, Cl. 210-85.000.
Sawada, Kenichi: *See—*
Watarai, Syu; Sawada, Kenichi; and Saida, Takeshi, 4,229,510, Cl. 430-38.000.
Schacht, Roy A. Feed mechanism for marking machine. 4,229,111, Cl. 400-45.000.
Schaefer, John O., to International Business Machines Corporation. Random stuffer ribbon cartridge with improved ribbon exit control. 4,229,112, Cl. 400-196.100.
Schaenzer, Gordon N. Chamfer tool. 4,229,129, Cl. 408-228.000.
Schafer, Paul; and Abel, Heinz, to Ciba-Geigy Corporation. Process for preventing oligomer deposits on dyed polyester textile material. 4,229,176, Cl. 8-582.000.
Schaible, Clifford W., to Bell Telephone Laboratories, Incorporated. Mobile radiotelephone station two-way ranging system. 4,229,620, Cl. 179-2.0EB.
Scharf, Rolf; Schlussler, Hans-Joachim; and Staschkiewicz, Friedrich, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method of inhibiting corrosion of aluminum with 2-phosphonobutane-1,2,4-tricarboxylic acid. 4,229,409, Cl. 422-13.000.
Scharfe, James A., Jr. Tuning indicator. 4,229,698, Cl. 375-88.000.
Schaumann, Wolfgang: *See—*
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.
Scheel, Frank R., to Carmet Company. Die assembly and method of making the same. 4,228,673, Cl. 72-467.000.
Scheidl, Franz: *See—*
Mayer, Norbert; Pfahler, Gerhard; Scheidl, Franz; and Wiezer, Hartmut, 4,229,382, Cl. 260-930.000.
Schellhammer, Carl-Wolfgang: *See—*
Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, 4,229,579, Cl. 548-256.000.
Scherbing, Frank J., to Chicago Lock Co. Axial split-pin tumbler-type lock mechanism. 4,228,668, Cl. 70-363.000.
Scherer, Hans: *See—*
Junge, Helmut; Kurtz, Walter; Dimroth, Peter; and Scherer, Hans, 4,229,343, Cl. 260-156.000.
Schering AG: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,229,208, Cl. 71-111.000.
Scherling, J. Daniel. Trapeze fixture. 4,229,000, Cl. 272-61.000.
Scheurecker, Werner, to Voest-Alpine Aktiengesellschaft. Strand guiding stand for continuous casting apparatus. 4,228,844, Cl. 164-448.000.
Schick, Hans: *See—*
Mueller-Tamm, Heinz; Jaggard, James F. R.; and Schick, Hans, 4,229,318, Cl. 252-429.00B.
Schielinsky, Gerhard: *See—*
Stumpp, Gerhard; and Schielinsky, Gerhard, 4,228,773, Cl. 123-505.000.
Schimitschek, Erhard J.; Celto, John E.; and Trias, John A., to United States of America, Navy. Metal dihalide photodissociation cyclic laser. 4,229,711, Cl. 331-94.50P.
Schimmel, Vernon R.; and Foszcz, Joseph L., to Symons Corporation. Attachment for anchoring a safety belt. 4,228,986, Cl. 249-202.000.
Schindler, James C.; and Kroll, Steve, to Restaurant Technology, Inc. Automatic french fryer. 4,228,730, Cl. 99-329.00R.
Schlomann, Kriemhild. Building blocks and connector means therefor. 4,228,628, Cl. 52-438.000.
Schlussler, Hans-Joachim: *See—*
Scharf, Rolf; Schlussler, Hans-Joachim; and Staschkiewicz, Friedrich, 4,229,409, Cl. 422-13.000.
Schmid, Walter; Wilfert, Karl, deceased (by Rischawy, Dorothea Wilfert nee, legar heir); and by Wilfert, Thomas, legal heir, to Daimler-Benz Aktiengesellschaft. Passenger motor vehicle. 4,229,021, Cl. 280-787.000.
Schmider, Antal: *See—*
Pucher, Janos; and Schmider, Antal, 4,229,143, Cl. 417-53.000.
Schmidt, Franz: *See—*
Sterzel, Hans-Josef; Wurmb, Rolf; Schmidt, Franz; and Seiler, Erhard, 4,229,553, Cl. 525-438.000.
Schmidt, Hermann: *See—*
Sattlegger, Hans; Schmidt, Hermann; and Schnurrbusch, Karl, 4,229,548, Cl. 521-110.000.

Schmidt, Oskar; and Sibral, Walter, to Lim-Holding, S.A. Polyurea polymer prepared from polyethers having heterocyclic groups and terminal amino groups. 4,229,561, Cl. 528-68.000.

Schmitt, Frederick L.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,229,599, Cl. 568-819.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,229,314, Cl. 252-174.110.

Schmoker, Peter, to Fotomec S.p.A. Photographic enlarger for producing giant-size prints. 4,229,098, Cl. 355-60.000.

Schneider, Abraham: *See*—
Hall, Lewis W., Jr.; Kerr, David L.; Hollstein, Elmer J.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,229,612, Cl. 585-823.000.

Schneider, Gordon L. Earthen cement compositions for building materials and process. 4,229,222, Cl. 106-74.000.

Schneider, Michel; and Lamy, Bernard, to Battelle Memorial Institute. Process for the dehydration of a colloidal dispersion of lipsomes. 4,229,360, Cl. 260-403.000.

Schneider, Walter: *See*—
Michal, Gerhard; Laube, Rolf; Roder, Albert; and Schneider, Walter, 4,229,529, Cl. 435-26.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,229,357, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,229,358, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,229,359, Cl. 260-397.200.

Schnurrbusch, Karl: *See*—
Sattlegger, Hans; Schmidt, Hermann; and Schnurrbusch, Karl, 4,229,548, Cl. 521-110.000.

Schoedel, Ulrich: *See*—
Wenzel, Franz; Schoedel, Ulrich; Jost, Heinz; and Pilz, Hans, 4,229,311, Cl. 252-50.000.

Schoenig, Frederick C., Jr.: *See*—
Arya, Satya P.; Grossman, Leonard N.; and Schoenig, Frederick C., Jr., 4,229,654, Cl. 250-358.00R.

Schoenthal, Galeon W.: *See*—
Slaugh, Lynn H.; and Schoenthal, Galeon W., 4,229,374, Cl. 260-563.00R.

Scholz, Howard W., Jr. Contra-angle ultrasonic endodontic instrument. 4,229,168, Cl. 433-124.000.

Schoonmaker, Edward B.; and Moran, Paul W. T., to Eastman Kodak Company. Stacking machine. 4,228,997, Cl. 271-315.000.

Schubert, Peter H.: *See*—
Wesche, Karlhans; Schubert, Peter H.; and Glitza, Horst W., 4,229,393, Cl. 264-42.000.

Schulte, Harvey L., to Kasper Instruments, Inc. Carrier for semiconductive wafers. 4,228,902, Cl. 211-41.000.

Schultz, Richard M., to Honeywell Inc. Line supervision. 4,229,734, Cl. 340-512.000.

Schulz, Alfred: *See*—
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, 4,228,700, Cl. 74-866.000.

Schulz, Volkmar: *See*—
Rampel, Hans; Hess, Peter; and Schulz, Volkmar, 4,228,981, Cl. 248-430.000.

Schurter, Rolf: *See*—
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,229,207, Cl. 71-107.000.

Schwab, Kurt, to D. Swarovski & Co. Glass mirror plate. 4,229,077, Cl. 350-293.000.

Schwalbe, Julian H., to Sperry Corporation. Acoustic under sea position measurement system. 4,229,809, Cl. 367-6.000.

Schwalme, Heinz: *See*—
Hertz, Walter; Stroh, Jan; and Schwalme, Heinz, 4,229,632, Cl. 200-148.00A.

Schwartz, Paul M.: *See*—
Baird, Joseph M.; and Schwartz, Paul M., 4,229,828, Cl. 455-326.000.

Schwefel, Ernst: *See*—
Burkhardt, Horst; Schwefel, Ernst; Baumgartner, Alfons; Mayer, Anton; and Rauth, Michael, 4,229,646, Cl. 235-92.0GC.

Schweikert, John F., to General Motors Corporation. Closed loop air/fuel ratio controller with asymmetrical proportional term. 4,228,775, Cl. 123-440.000.

Schweizerische Lokomotiv-und Maschinenfabrik: *See*—
Vogel, Hans H., 4,228,740, Cl. 105-168.000.

Sclafani, Joseph R., to Reliable Automatic Sprinkler Co., The. Dry sprinkler with non-load-transmitting sealing arrangement. 4,228,858, Cl. 169-41.000.

SCM Corporation: *See*—
Ting, Vincent W.; and Evans, James M., 4,229,335, Cl. 260-29.40R.

Scott, Alexander, to Rolls-Royce (1971) Ltd. Turbine blade. 4,229,140, Cl. 416-97.00R.

Sea Horse Corporation, The: *See*—
Brown, Lee O., 4,229,121, Cl. 405-158.000.

Sealey, Francis, to Boeing Company, The. Kneeling nose landing gear assembly. 4,228,975, Cl. 244-102.00R.

Searls, Henry H. Automatically energizable lifesaving equipment. 4,228,556, Cl. 9-14.000.

Seaward, William S.: *See*—
Janssen, Donovan M.; Radman, Anton J., Jr.; and Seaward, William S., 4,229,774, Cl. 360-98.000.

Seetru Limited: *See*—
Potter, Michael B., 4,228,987, Cl. 251-210.000.

Seibel, Gerd: *See*—
Dunkel, Franz-Heinz; Klinkhammer, Ralf L.; Nebel, Heinz; Spanner, Siegfried; and Seibel, Gerd, 4,228,579, Cl. 29-430.000.

Seikisui Kagaku Kogyo Kabushiki Ltd.: *See*—
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigashi, Naofumi, 4,229,495, Cl. 428-36.000.

Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi; Onda, Eiichi; Yonemoto, Tomoo; and Nagaoka, Shinji, 4,229,089, Cl. 354-25.000.
Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; Onda, Eiichi; and Nemoto, Ichiro, 4,229,093, Cl. 354-266.000.

Seiler, Erhard: *See*—
Sterzel, Hans-Josef; Wurmb, Rolf; Schmidt, Franz; and Seiler, Erhard, 4,229,553, Cl. 525-438.000.

Seiler, Georg, to Eisenwerke Friedr. Wilh. Duker GmbH & Co. Socket connection for pipes and pipe elements. 4,229,026, Cl. 285-105.000.

Seiz, Wolfgang: *See*—
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,229,576, Cl. 544-222.000.

Sekiya, Fukuo: *See*—
Ebihara, Heihachiro; and Sekiya, Fukuo, 4,229,668, Cl. 307-304.000.

Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, to Meuji Seika Kaisha Ltd. 5-Substituted picolinic acid derivatives and an anti-hypertensive composition containing the same. 4,229,448, Cl. 424-245.000.

Sellera, Jose M. Hanging device for pictures. 4,228,982, Cl. 248-467.000.

SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See*—
Chadda, Madan M.; and Maier, Reinhold, 4,228,581, Cl. 29-578.000.

Sempliner, Arthur T.: *See*—
Teague, Walter D., Jr.; and Sempliner, Arthur T., 4,229,150, Cl. 418-50.000.

Seymour, Samuel L., to PPG Industries, Inc. Shaping glass sheets by drop forming with differential vacuum release. 4,229,199, Cl. 65-106.000.

Seymour, Samuel L., to PPG Industries, Inc. Drop forming glass sheets with auxiliary shaping means. 4,229,200, Cl. 65-106.000.

Sezaki, Masaji: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.

Shakespeare Company: *See*—
Vo, Thang; and Lewis, John R., Jr., 4,229,743, Cl. 343-749.000.

Shandon Southern Products Limited: *See*—
Gordon, Alan J., 4,228,926, Cl. 222-103.000.

Shapovalova, Lidia P.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Sharkey, Hubert J., to Emery Industries, Inc. Copolyamide resins from piperazine and polyoxyalkylene diamine having improved creep resistance. 4,229,567, Cl. 528-338.000.

Sharp, Gerald B.; Petrak, Karel L.; Boielle, John H.; Wagner, Hans M.; and Langford, John F., to Eastman Kodak Company. Photo-polymerizable water-developable composition and elements. 4,229,519, Cl. 430-287.000.

Sharp Kabushiki Kaisha: *See*—
Take, Hiroshi; Koyanagi, Katubumi; and Uede, Hisashi, 4,229,080, Cl. 350-357.000.

Sharpe, Donald E., to Automation Industries, Inc. Accurate distance amplitude compensation. 4,228,688, Cl. 73-631.000.

Shaver, Robert G.; and Leake, William R., to Versar, Inc. Process for making hollow carbon microspheres. 4,229,425, Cl. 423-449.000.

Shaw, Graham C.: *See*—
United States of America, National Aeronautics and Space Administration; and Shaw, Graham C., 4,229,182, Cl. 23-293.00R.

Shedd, Robert W.: *See*—
Smith, Willard P.; Michaels, Harry J.; and Shedd, Robert W., 4,228,767, Cl. 122-4.00D.

Shell Oil Company: *See*—
Coffman, Paul M., 4,229,405, Cl. 264-313.000.
Colby, Thomas H., 4,229,594, Cl. 568-635.000.
Gum, Clarence R.; and Kister, Albert T., 4,229,607, Cl. 585-520.000.
Hansen, David R.; and Himes, Glenn R., 4,229,338, Cl. 260-33.6AQ.
Nozaki, Kenzie, 4,229,605, Cl. 585-509.000.
Nozaki, Kenzie, 4,229,606, Cl. 585-509.000.
Slaugh, Lynn H., 4,229,320, Cl. 252-454.000.
Slaugh, Lynn H.; and Schoenthal, Galeon W., 4,229,374, Cl. 260-563.00R.
Smutny, Edgar J.; and Colby, Thomas H., 4,229,380, Cl. 568-435.000.

Wijffels, Joannes B.; Pegels, Abraham A.; and Wezenberg, Arnold, 4,229,418, Cl. 422-191.000.
Shelley, Julian H.; Clamp, John R.; and Hartog, Martin, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing bromhexine and method of treating diabetic nephropathy therewith. 4,229,477, Cl. 424-330.000.
Shen, Tsung-Ying: *See*—
Bugianesi, Robert L.; Ponpipom, Mitree M.; and Shen, Tsung-Ying, 4,229,441, Cl. 424-182.000.
Shepard, Kenneth L.; and Halczenko, Wasyl, to Merck & Co., Inc. Imino-bridged benzocycloheptapyridines. 4,229,455, Cl. 424-256.000.
Shepler, Edward E.: *See*—
Gaudelli, Edmond N.; and Shepler, Edward E., 4,228,985, Cl. 249-93.000.
Sherrod, C. David, to Carrier Corporation. Method of electrical connector. 4,228,584, Cl. 29-863.000.
Shibahara, Tetsuya: *See*—
Shigematsu, Taichiro; Shibahara, Tetsuya; and Nakajima, Tetsuo, 4,229,433, Cl. 424-78.000.
Shibata, Uichi: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
Shibata, Yutaka; Tanaka, Nobuyuki; and Maruyama, Ichiro, to Sumitomo Electric Industries, Ltd. Oil/water storage tank having flexible partition membrane and chamfered internal edges and corners. 4,228,754, Cl. 114-74.00R.
Shibukawa, Mitsuru: *See*—
Shibuya, Chisei; Itoh, Hirataka; Ishii, Kunihiko; Ishida, Torao; and Shibukawa, Mitsuru, 4,229,573, Cl. 544-21.000.
Shibuya, Chisei; Itoh, Hirataka; Ishii, Kunihiko; Ishida, Torao; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. 7α-Methoxycephalosporin derivatives. 4,229,573, Cl. 544-21.000.
Shigematsu, Taichiro; Shibahara, Tetsuya; and Nakajima, Tetsuo, to Mitsubishi Chemical Industries Limited. Method for controlling viral diseases in plants. 4,229,433, Cl. 424-78.000.
Shigematsu, Taichiro; Yoshida, Kenji; Nakazawa, Makoto; Kasugai, Hiroshi; and Tsuda, Masataka, to Mitsubishi Chemical Industries Limited. Fungicidal 6-(3,5-dichlorophenyl)perhydroimidazo[5,1-b]thiazole derivatives. 4,229,461, Cl. 424-270.000.
Shikishima Tipton Manufacturing Co. Ltd.: *See*—
Kobayashi, Hisamine; Kawasaki, Motoo; Mizumoto, Shozo; Nawafune, Hidemi; and Suzuki, Sadamasa, 4,229,276, Cl. 204-222.000.
Shimamura, Isao: *See*—
Nakamura, Shigeru; Shimamura, Isao; Nakamura, Taku; Sakaguchi, Shinji; Miyazako, Takushi; Sugiyama, Masatoshi; and Mitsui, Akio, 4,229,522, Cl. 430-390.000.
Shimano, Takashi; Masukata, Yoshimasa; and Sato, Hiromitsu, to Furukawa Electric Co., Ltd., The. Process of producing a foamed plastic insulated conductor and an apparatus therefor. 4,229,392, Cl. 264-40.100.
Shimizu, Hidetoshi: *See*—
Makino, Yoshimi; and Shimizu, Hidetoshi, 4,229,328, Cl. 260-16.000.
Shimizu, Sakayu: *See*—
Yamada, Hideaki; Shimizu, Sakayu; and Tani, Yoshiki, 4,229,538, Cl. 435-193.000.
Shimizu, Takeshi, to Kabushikikaisha Anoa. Fishing toy. 4,229,003, Cl. 273-1.00E.
Shimomura, Keizo: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Wada, Norinobu; and Shirota, Yoshihiro, 4,229,568, Cl. 528-500.000.
Shin Meiwa Industry Co., Ltd.: *See*—
Ihara, Yasushi, 4,229,641, Cl. 219-125.100.
Sakurai, Hajime; and Higuchi, Yoshinori, 4,229,642, Cl. 219-125.100.
Shinagawa Refractories Co., Ltd.: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,229,221, Cl. 106-58.000.
Shindo, Minoru: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Shinko Electric Co., Ltd.: *See*—
Akama, Masaru, 4,229,288, Cl. 209-212.000.
Shinko-Pfaudler Company, Ltd.: *See*—
Tanabe, Kaichi; Koga, Shigeto; and Maeda, Yoshinori, 4,228,943, Cl. 228-182.000.
Shinko, Toyotaro: *See*—
Konii, Susumu; Yoshimura, Yukio; Nanaumi, Ken; Yasuzawa, Kohei; Yoshida, Takeshi; and Shinko, Toyotaro, 4,229,330, Cl. 260-19.00R.
Shinohara, Masanao: *See*—
Miyazaki, Wasei; Kaise, Hirotsugu; Nakano, Yoshimasa; Izawa, Taketoshi; Oshiro, Yasuo; and Shinohara, Masanao, 4,229,466, Cl. 424-279.000.
Shinohara, Yoshiaki, to Kawasaki Steel Corporation. Heating furnace. 4,229,163, Cl. 432-194.000.
Shinozaki, Masanobu: *See*—
Takahashi, Nobuaki; Funasaka, Eiichi; Shinozaki, Masanobu; and Kaizu, Yasuo, 4,229,619, Cl. 179-1.00D.
Shinozaki, Teizo: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,229,348, Cl. 260-239.100.
Shinozuka, Masanobu. Pressure-sustaining vessel. 4,228,759, Cl. 114-342.000.
Shiomi, Michio: *See*—
Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, 4,229,440, Cl. 424-180.000.
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, to Teijin Limited; and Nissan Chemical Industries Ltd. Fire-retardant polyester compositions. 4,229,552, Cl. 525-437.000.
Shipley Company Inc.: *See*—
Gulla, Michael; and Hartnett, Barry J., 4,229,218, Cl. 106-1.230.
Shirai, Koichi: *See*—
Arai, Eisuke; Kamei, Kuniaki; Kawasaki, Akio; Takagi, Fumio; Shirai, Koichi; and Orihara, Yasuharu, 4,229,239, Cl. 156-155.000.
Shirasaki, Jun: *See*—
Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, 4,229,523, Cl. 430-532.000.
Shirota, Yoshihiro: *See*—
Wada, Norinobu; and Shirota, Yoshihiro, 4,229,568, Cl. 528-500.000.
Shiseido Co., Ltd.: *See*—
Ikeda, Toshihide; and Nakano, Motokiyo, 4,229,227, Cl. 106-181.000.
Shlager, Abraham E. Layout tool for locating holes on structural steel. 4,228,594, Cl. 33-189.000.
Shmagina, Nina N.: *See*—
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N., 4,229,560, Cl. 528-4.000.
Shmuk, Jury A.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.
Shop-Vac Corporation: *See*—
Miller, Jonathan, 4,229,193, Cl. 55-318.000.
Short, Allen E. Exhaust nozzle for jet engines. 4,228,652, Cl. 60-263.000.
Shoshan, Itamar. Wavelength selector for tunable laser. 4,229,710, Cl. 331-94.50C.
Showa Aluminium K.K.: *See*—
Hirai, Takashi; and Hino, Tadahiro, 4,228,791, Cl. 126-450.000.
Shushlebin, Boris A.; Lyakishev, Nikolai P.; Tregubenko, Viktor V.; Ignatenko, Gennady F.; and Subbotin, Nikolai I. Process for combined production of ferrosilicozirconium and zirconium corundum. 4,229,214, Cl. 75-133.000.
Shuster, Kim S.: *See*—
Andoniev, Sergei M.; Laktjushina, Valentina Y.; Medvedovsky, Viliam M.; and Shuster, Kim S., 4,229,190, Cl. 55-112.000.
Sibley, Henry C., to General Signal Corporation. Apparatus for sensing vehicular mechanical motion. 4,229,663, Cl. 307-9.000.
Sibral, Walter: *See*—
Schmidt, Oskar; and Sibral, Walter, 4,229,561, Cl. 528-68.000.
Sicklesteel, Bruce G.; and Anders, Dale F., to DeSoto, Inc. Self cross-linking N-methylol functional emulsion polymers using polycarboxylic acid surfactant. 4,229,336, Cl. 260-29.6NR.
Siegfried Aktiengesellschaft: *See*—
Granwehr, Bernhard; and Gnehm, Rene, 4,229,367, Cl. 260-465.00R.
Siemens Aktiengesellschaft: *See*—
Dederer, Guenter; and Muerkl, Helmut, 4,229,637, Cl. 219-86.250.
Hertz, Walter; Stroh, Jan; and Schwalme, Heinz, 4,229,632, Cl. 200-148.00A.
Sipos, Balint, 4,229,766, Cl. 358-209.000.
Vieweg, Gunther; and Sturzl, Wilhelm, 4,229,795, Cl. 364-483.000.
Wetzel, Klaus, 4,228,779, Cl. 123-652.000.
Siemer, Sidney R., to W. R. Grace & Co. Phosphorus compounds as sugarcane ripeners. 4,229,203, Cl. 71-86.000.
Siemer, Sidney R., to W. R. Grace & Co. S-triazines as sugarcane ripeners. 4,229,206, Cl. 71-93.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Watzka, Roland; and Bartholme, Henri, 4,228,901, Cl. 209-684.000.
Signode Corporation: *See*—
Lems, Peter; and Meier, William A., 4,228,565, Cl. 24-20.0EE.
Silver Engineering Works, Inc.: *See*—
Price, Frank B.; and Vertenstein, Mathieu J., 4,229,279, Cl. 204-297.00R.
Silverbage, Sten. Sensitive measuring cell for a differential refractometer of the interference type. 4,229,105, Cl. 356-246.000.
Silverman, Peter J.; and Rose, Donald K., to Intel Magnetics, Inc. Process for forming bonding pads on magnetic bubble devices. 4,229,248, Cl. 156-653.000.

Simes Societa Italiana Medicinali e Sintetici S.p.A.: *See—*
Ferrari, Giorgio; and Vecchietti, Vittorio, 4,229,450, Cl. 424-248.520.

Sinitsyn, Pavel R.: *See—*
Motin, Jury D.; Reformatsky, Igor A.; Sinitsyn, Pavel R.; Ivanov, Nikolai M.; Malakhov, Igor K.; and Ivanov, Boris I., 4,229,069, Cl. 350-96.290.

Sipos, Balint, to Siemens Aktiengesellschaft. Scanning apparatus and method for operating the apparatus. 4,229,766, Cl. 358-209.000.

Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene phenylene anionic naphthalenesulfonic acids. 4,229,370, Cl. 260-506.000.

Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene phenylene anionic naphthalenesulfonic acids. 4,229,372, Cl. 260-507.00R.

Sixt, Karl: *See—*
Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, 4,228,769, Cl. 123-52.00M.

Skeen, James E., to Superior Industries International, Inc. Process for making a vehicle wheel. 4,228,671, Cl. 72-53.000.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,229,055, Cl. 308-26.000.

Skinner, Maurice W.: *See—*
Dawson, David G.; Osmond, Desmond W. J.; Skinner, Maurice W.; and West, Edmund J., 4,229,224, Cl. 106-90.000.

Sladek, Theodore E.; and Maynard, Donald E. Surface effect boat. 4,228,752, Cl. 114-67.00A.

Slaton, Clifton F., to Colgate-Palmolive Company. Surfactant concentration detector. 4,228,678, Cl. 73-64.400.

Slaugh, Lynn H., to Shell Oil Company. Catalyst for making paraxylene. 4,229,320, Cl. 252-454.000.

Slaugh, Lynn H.; and Schoenthal, Galeon W., to Shell Oil Company. Amine process using Cu-Sn-Na catalyst. 4,229,374, Cl. 260-563.00R.

SMAC ACIEROID: *See—*
Reneault, Patrick; and Ovaert, Francis, 4,228,624, Cl. 52-145.000.

Smeltzer, Ronald K.: *See—*
Wu, Chung P.; and Smeltzer, Ronald K., 4,229,502, Cl. 428-446.000.

Smirl, Richard L., to Borg-Warner Corporation. Variable pulley transmission. 4,228,691, Cl. 474-12.000.

Smirlock, Martin E.; and Smith, Donald A., to Combustion Engineering, Inc. High energy arc ignition of pulverized coal. 4,228,747, Cl. 110-347.000.

Smith, Bernard; and Delano, Frank P. Hydrofoil sailboat with control tiller. 4,228,750, Cl. 114-39.000.

Smith, Burton J.: *See—*
Gilliland, Maxwell C.; Smith, Burton J.; and Ferguson, Gary L., 4,229,790, Cl. 364-200.000.

Smith, Donald A.: *See—*
Smirlock, Martin E.; and Smith, Donald A., 4,228,747, Cl. 110-347.000.

Smith, Galyn F.; and Zwierszowski, Thomas P., to American Hospital Supply Corporation. Surgical instrument rack. 4,229,420, Cl. 422-310.000.

Smith, Gerald L., to International Business Machines Corporation. Tight tolerance zero crossing detector circuit. 4,229,669, Cl. 307-354.000.

Smith, Irl W., Jr.: *See—*
Dorschner, Terry A.; Smith, Irl W., Jr.; and Statz, Hermann, 4,229,106, Cl. 356-350.000.

Smith, Kenneth E.: *See—*
Hatcher, Charles S.; and Smith, Kenneth E., 4,229,404, Cl. 264-290.500.

Smith, Peter J.; and Bava, Kishor. Dental prostheses fitting. 4,229,169, Cl. 433-174.000.

Smith, Robert E.; and Dolbeare, Frank A. Fluorescence method for enzyme analysis which couples aromatic amines with aromatic aldehydes. 4,229,528, Cl. 435-23.000.

Smith, Robert L. Magic chorder. 4,228,718, Cl. 84-317.000.

Smith, Robert W.: *See—*
Davis, James P.; and Smith, Robert W., 4,228,733, Cl. 100-4.000.

Smith, Willard P.; Michaels, Harry J.; and Shedd, Robert W., to Johnston Boiler Company. Self contained boiler package utilizing atmospheric fluidized bed combustion. 4,228,767, Cl. 122-4.00D.

Smith, William: *See—*
Chapman, Edward S.; and Smith, William, 4,229,421, Cl. 423-10.000.

Smith, Winthrop W., to Westinghouse Electric Corp. Spread beam computational hardware for digital beam controllers. 4,229,739, Cl. 343-100.0SA.

Smolik, Robert A. Electrical receptable box and method of installation. 4,229,614, Cl. 174-58.000.

Smorol, Michael E., to Carrier Corporation. Control apparatus for a two-speed heat pump. 4,228,846, Cl. 165-2.000.

Smutny, Edgar J.; and Colby, Thomas H., to Shell Oil Company. Preparation of 3-phenoxybenzaldehyde. 4,229,380, Cl. 568-435.000.

Snyder, George R., to Risdon Corporation. Identification badge clip. 4,228,569, Cl. 24-252.00R.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Consigli, Armando; and Danna, Roberto, 4,229,788, Cl. 364-200.000.

Societe Anonyme Roure Bertrand Dupont: *See—*
Teisseire, Paul J.; and Maupetit, Pierre, 4,229,323, Cl. 252-522.00R.

Societe de Recherches Industrielles (SORI): *See—*
Majoie, Bernard, 4,229,439, Cl. 424-180.000.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Jaunin, Jean-Pierre, 4,228,648, Cl. 368-185.000.

Solter, Dieter: *See—*
Lahme, Gerhard; Solter, Dieter; and Bohnsack, Hermann, 4,229,104, Cl. 356-246.000.

Sommer, Gerd: *See—*
Sterki, Armin; and Sommer, Gerd, 4,228,591, Cl. 33-174.00L.

Sony Corporation: *See—*
Ito, Takamasa, 4,229,770, Cl. 360-15.000.
Makino, Yoshimi; and Shimizu, Hidetoshi, 4,229,328, Cl. 260-16.000.
Sakamoto, Hitoshi, 4,229,773, Cl. 360-70.000.

Sorensen, Leif: *See—*
Lambach, Heinrich W.; and Sorensen, Leif, 4,228,900, Cl. 206-260.000.

Sosnowski, John, to Exxon Research & Engineering Co. Fluid hydrocoking with the addition of dispersible metal compounds. 4,229,283, Cl. 208-127.000.

Soteropulos, Gust: *See—*
Rabe, David L.; Hudson, Colin M.; and Soteropulos, Gust, 4,228,638, Cl. 56-341.000.

Southern Weaving Company: *See—*
Orr, Lawrence W., Jr.; and Ross, Edgar A., 4,229,615, Cl. 174-117.00M.

Sova, Stanley G.: *See—*
Suskind, Stuart P.; and Sova, Stanley G., 4,229,472, Cl. 428-113.000.

Sowell, Lyles H., to Du Pont de Nemours, E. I., and Company. Gasket for yarn spinning pack. 4,228,917, Cl. 220-378.000.

Spanner, Siegfried: *See—*
Dunkel, Franz-Heinz; Klinkhammer, Ralf L.; Nebel, Heinz; Spanner, Siegfried; and Seibel, Gerd, 4,228,579, Cl. 29-430.000.

Spary, Norman B.: *See—*
Harris, Clifford E.; and Spary, Norman B., 4,228,912, Cl. 220-4.00R.

Speaight, David C.; and Longfoot, Gerald, to Wellworthy Limited. Pistons. 4,228,727, Cl. 92-228.000.

Specht, Steven J., to Olin Corporation. Glove-like diaphragm structure for electrolytic cells. 4,229,277, Cl. 204-252.000.

Spector, Arthur: *See—*
Dornau, Peter G.; and Spector, Arthur, 4,228,758, Cl. 114-219.000.

Sperry Corporation: *See—*
Josephs, Richard M., 4,229,806, Cl. 365-8.000.
Schwaibe, Julian H., 4,229,809, Cl. 367-6.000.

Sperry, Kenneth D., to General Motors Corporation. Engine cylinder exhaust port. 4,228,653, Cl. 60-272.000.

Sperry Rand Corporation: *See—*
Torok, Ernest J.; Fleming, David L.; and Johansen, Thomas R., 4,229,072, Cl. 350-151.000.

Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for preparing thio-indigo dyestuffs. 4,229,583, Cl. 549-52.000.

Spire Corporation: *See—*
Kirkpatrick, Allen R., 4,229,232, Cl. 148-1.500.

Spolverini, Renzo: *See—*
De Vivo, Alessandro; Pierantozzi, Gianni; Santarpia, Diodato; and Spolverini, Renzo, 4,228,557, Cl. 15-21.00E.

Spoor, Herbert: *See—*
Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, 4,229,551, Cl. 525-337.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivatives, processes for preparing same and organoleptic uses thereof. 4,229,314, Cl. 252-174.110.

SRI International: *See—*
Uthe, Edward E., 4,229,653, Cl. 250-339.000.

Stach, Kurt, deceased: *See—*
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.

Stadler, Paul: *See—*
Fehr, Theodor; and Stadler, Paul, 4,229,451, Cl. 424-250.000.

Stahly, Frederick A.: *See—*
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,229,513, Cl. 430-115.000.

Stanaback, Robert J.: *See—*
Feldman, Martin L.; Goodman, Donald; Koral, Marvin; Miller, Robert S.; and Stanaback, Robert J., 4,229,569, Cl. 528-501.000.

Stanchenko, Galina I.: *See—*
Morin, Boris P.; Voinova, Galina J.; Breusova, Irina P.; Stanchenko, Galina I.; and Rogovin, Zakhar A., 4,229,326, Cl. 260-8.000.

Standard Container Company: *See—*
Weingardt, Rolf E., 4,228,916, Cl. 220-354.000.

Stapley, Edward O.: *See—*
Kahan, Jean S.; Kahan, Frederick M.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,229,534, Cl. 435-119.000.

Starch, Hermann C.: *See—*
Hahn, Reinhard, 4,229,217, Cl. 75-244.000.

Starinshak, Thomas W.: *See—*
Lowery, Richard K.; and Starinshak, Thomas W., 4,229,268, Cl. 204-55.00R.

Stark, Karl, to Saphirwerk Industrieprodukte AG. Gas-tight ball valve. 4,228,821, Cl. 137-533.110.

Starks, Charles M.: *See—*
Weimer, Dean R.; and Starks, Charles M., 4,229,598, Cl. 568-792.000.

Starkstrom Schaltgeraetefabriken Sprindler Deissler GmbH & Co. KG: *See—*
Lemmer, Helmut, 4,229,719, Cl. 335-132.000.

Staschkiewicz, Friedrich: *See—*
Scharf, Rolf; Schlussler, Hans-Joachim; and Staschkiewicz, Friedrich, 4,229,409, Cl. 422-13.000.

Statz, Hermann: *See—*
Dorschner, Terry A.; Smith, Irl W., Jr.; and Statz, Hermann, 4,229,106, Cl. 356-350.000.

Stauner, Thomas: *See—*
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,229,577, Cl. 548-138.000.

Steag Kernenergie GmbH: *See—*
Baatz, Henning; and Rittscher, Dieter, 4,229,316, Cl. 252-301.10W.

Stecher, Vera J.; and Chinea, George L., to Ciba-Geigy Corporation. Adherence column. 4,229,414, Cl. 422-101.000.

Steelastic Company, The: *See—*
Vanderzee, Robert S., 4,229,246, Cl. 156-417.000.

Steels, Gordon; and Dacey, Raymond G., to Baker Perkins Holdings Limited. Process for the production of center-filled bars of confectionery. 4,229,484, Cl. 426-279.000.

Steigerwald Strahltechnik GmbH: *See—*
Koy, Johannes; Rappold, Franz; and Kappelsberger, Erwin, 4,229,639, Cl. 219-121.0EM.

Stein, Thomas R.: *See—*
Peters, Alan W.; Bowes, Emmerson; and Stein, Thomas R., 4,229,282, Cl. 208-111.000.

Steinbach, Harold. Tool setting gage. 4,228,595, Cl. 33-201.000.

Steinecker, Carl, to Richardson Chemical Company. Alkaline bright zinc plating and additive therefor. 4,229,267, Cl. 204-55.00R.

Steinemann, Hans, to Micafil, AG. Solar heater, building cladding unit. 4,228,787, Cl. 126-433.000.

Steinmetz, Werner: *See—*
Luethi, Peter; and Steinmetz, Werner, 4,228,814, Cl. 134-58.00R.

Stendel, Wilhelm: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,229,444, Cl. 424-200.000.

Stephens, Geoffrey B.: *See—*
Bergeron, David L.; and Stephens, Geoffrey B., 4,229,753, Cl. 357-28.000.

Sterki, Armin; and Sommer, Gerd, to Maag Gear Wheel & Machine Co. Ltd. Measurement sensing devices. 4,228,591, Cl. 33-174.00L.

Stern, Elaine S.: *See—*
Johnsen, Vernon L.; and Stern, Elaine S., 4,229,429, Cl. 424-47.000.

Sterzel, Hans-Josef; Wurmb, Rolf; Schmidt, Franz; and Seiler, Erhard, to BASF Aktiengesellschaft. Stabilized poly(alkyiene terephthalate) molding materials. 4,229,553, Cl. 525-438.000.

Stetter, Jorg: *See—*
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.

Stewart, Don S. D.; and Ricke, Jack L. File guide for use in sharpening a chain saw. 4,228,702, Cl. 76-36.000.

Stewart, Robert E.: *See—*
Levy, John V.; Rodgers, David; Stewart, Robert E.; Potter, David; and Casabona, Richard J., 4,229,791, Cl. 364-200.000.

Stiles, Claude J.: *See—*
Donaldson, Charles R.; and Stiles, Claude J., 4,229,416, Cl. 422-134.000.

Stillwell, Billy E.: *See—*
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Stock, Hugo: *See—*
Herschmann, Otto; Zernig, Norbert; Holthausen, Dieter; Stock, Hugo; and Tholen, Paul, 4,228,655, Cl. 60-602.000.

Stockford, William F.; and Gamewell, Joseph M., to Gamewell Manufacturing, Inc. Movable, continuously changing, self-charging electrostatic filter. 4,229,187, Cl. 55-14.000.

Stokes, Alvin R. Floor type pool game apparatus. 4,229,004, Cl. 273-3.00C.

Stolzer, Claus: *See—*
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.

Storer, John E., Jr., to Sailing Systems, Inc. Catamaran tiller-crossbar connector. 4,228,756, Cl. 114-144.00R.

Strachan, Denis M.: *See—*
Babad, Harry; and Strachan, Denis M., 4,229,317, Cl. 252-301.10W.

Straub, Ferdinand; Spoor, Herbert; and Cordes, Claus, to BASF Aktiengesellschaft. Preparation of modified polymers of N-vinylpyrrolid-2-one and their use for the preparation of polymers interrupted by bridge members. 4,229,551, Cl. 525-337.000.

Streinz, Ludwig: *See—*
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Streng, DeWayne A., to International Telephone and Telegraph Corporation. Method for making multiple optical core fiber. 4,229,197, Cl. 65-4.00B.

Striegel, Oskar, to Friedrich Munch Silber-und Alpaccawarenfabrik. Decorative linkwork. 4,229,496, Cl. 428-53.000.

Stroh, Jan: *See—*
Hertz, Walter; Stroh, Jan; and Schwalme, Heinz, 4,229,632, Cl. 200-148.00A.

Strohlein GmbH & Co.: *See—*
Orths, Kurt; Prumbaum, Roland; and Berger, Peter, 4,229,412, Cl. 422-80.000.

Structural Fibers, Inc.: *See—*
Wiltshire, Arthur J.; Nara, Harry R.; Le Breton, Edward T.; and Bliley, Ward L., 4,228,575, Cl. 29-407.000.

Studiengesellschaft Kohle mbH: *See—*
Bogdanovic, Borislav, 4,229,354, Cl. 260-347.200.

Stumpp, Gerhard; and Schielinsky, Gerhard, to Robert Bosch GmbH. Device to activate an adjusting member in dependence on load. 4,228,773, Cl. 123-505.000.

Sturzl, Wilhelm: *See—*
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Subbotin, Nikolai I.: *See—*
Shushlebin, Boris A.; Lyakishev, Nikolai P.; Tregubenko, Viktor V.; Ignatenko, Gennady F.; and Subbotin, Nikolai I., 4,229,214, Cl. 75-133.000.

Subramanian, Kohur N.; Bell, Malcolm C. E.; Thomas, John A.; and Nissen, Norman C., to International Nickel Co., Inc., The. Process for the recovery of metal values from anode slimes. 4,229,270, Cl. 204-109.000.

Suda, Minoru: *See—*
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Suga, Yoshinori: *See—*
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Suganuma, Hisashi, to Pioneer Electronic Corporation. Automatic gain control circuit. 4,229,707, Cl. 330-277.000.

Sugawara, Hiroyuki: *See—*
Arakawa, Hideo; Namekawa, Takashi; Kuniya, Keiichi; and Sugawara, Hiroyuki, 4,229,631, Cl. 200-144.00B.

Suggs, James L.; and Buck, Dan F., to Eastman Kodak Company. Emulsifiers for baked goods. 4,229,480, Cl. 426-24.000.

Suggs, James L.; and Buck, Dan F., to Eastman Kodak Company. Pasta conditioner. 4,229,488, Cl. 426-557.000.

Sugimoto, Hiroyuki: *See—*
Tabushi, Iwao; Sugimoto, Hiroyuki; and Yazaki, Akira, 4,229,356, Cl. 260-396.00K.

Sugiya, Teruo: *See—*
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Sugiyama, Hiroshi: *See—*
Kanai, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, 4,229,417, Cl. 422-176.000.

Sugiysma, Masatoshi: *See—*
Nakamura, Shigeru; Shimamura, Isao; Nakamura, Taku; Sakaguchi, Shinji; Miyazako, Takushi; Sugiysma, Masatoshi; and Mitsui, Akio, 4,229,522, Cl. 430-390.000.

Suh, Kyung W.; and Amos, Charles R., to Dow Chemical Company, The. Method of extruding thermoplastic resin foams having enlarged cell-sizes. 4,229,396, Cl. 264-53.000.

Sumitomo Chemical Company Limited: *See—*
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,229,469, Cl. 424-304.000.

Sumitomo Electric Industries, Ltd.: *See—*
Saito, Yasunori, 4,229,238, Cl. 156-50.000.
Shibata, Yutaka; Tanaka, Nobuyuki; and Maruyama, Ichiro, 4,228,754, Cl. 114-74.00R.

Sumitomo, Hiroyuki, to Hisaka Works, Ltd. Plate used in condenser. 4,228,850, Cl. 165-110.000.

Suntech, Inc.: *See—*
Hall, Lewis W., Jr.; Kerr, David L.; Hollstein, Elmer J.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,229,612, Cl. 585-823.000.

Superior Industries International, Inc.: *See—*
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Surtani, Kishin: *See—*
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Suskind, Stuart P.; and Sova, Stanley G., to Inmont Corporation. Sheet material. 4,229,472, Cl. 428-113.000.

Sustek, Alvin J., Jr.; Frazier, Terry L.; and Daryl, Gregory, to Texaco Inc. Method of injectivity profile logging for two phase flow. 4,228,855, Cl. 166-250.000.

Suzuki, Hajime; Hamada, Hiroyuki; and Ichikawa, Rinjiro, to Toyo Boseki Kabushiki Kaisha. Light-polarizing film. 4,229,498, Cl. 428-212.000.

Suzuki, Hiroaki: *See—*
Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, 4,229,085, Cl. 353-75.000.

Suzuki, Sadamasa: *See—*
Kobayashi, Hisamine; Kawasaki, Motoo; Mizumoto, Shozo; Nawafune, Hidemi; and Suzuki, Sadamasa, 4,229,276, Cl. 204-222.000.

Suzuki, Shin-ichi: *See—*
Ichikawa, Atsushi; Tomita, Kenkichi; Horiuchi, Taku; Suzuki, Shin-ichi; and Sakuma, Akira, 4,229,471, Cl. 424-320.000.

Suzuki, Takami; Iwata, Nobuo; and Tsunasawa, Masami, to Ricoh Company, Ltd. Method of making rotary type wheels. 4,228,577, Cl. 29-418.000.

Svensson, Gustav E. V., to Autoliv AB. Device in connection with reel mechanisms for safety belts for automobiles. 4,228,969, Cl. 242-107.40A.

Svintsov, Nikolai I.: *See—*
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Svoboda, Josef, to TMC Corporation. Safety strap for skis. 4,229,020, Cl. 280-618.000.

Swan, Jack C., Jr., to Hanson Industries Incorporated. Viscous, flowable, pressure-compensating fitting compositions having therein both glass and resinous microbeads. 4,229,546, Cl. 521-55.000.

Swope, Jack G., to Rennco Incorporated. Manual bag sealer with lift bar. 4,229,244, Cl. 156-358.000.

Symons Corporation: *See—*
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Syntex (U.S.A.) Inc.: *See—*
Jones, Gordon H.; and Young, John, 4,229,478, Cl. 424-331.000.

Szabo, Gabor: *See—*
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,229,366, Cl. 260-465.00F.

Szabo, Gabor T.: *See—*
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, 4,229,366, Cl. 260-465.00F.

Tabakov, Albert V.: *See—*
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Tabara, Nobuo: *See—*
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Tabushi, Iwao; Sugimoto, Hiroyuki; and Yazaki, Akira, to Wakunaga Yakuhin Kabushiki Kaisha. Production of vitamin K_1 and vitamin K_2. 4,229,356, Cl. 260-396.00K.

Taguchi, Thoru; Ago, Tokinori; and Hashimoto, Isao, to Mitsui Petrochemical Industries Ltd. Process for the preparation of resorcin. 4,229,597, Cl. 568-768.000.

Takagi, Fumio: *See—*
Arai, Eisuke; Kamei, Kuniaki; Kawasaki, Akio; Takagi, Fumio; Shirai, Koichi; and Orihara, Yasuharu, 4,229,239, Cl. 156-155.000.

Takagi, Hideo: *See—*
Ohkuma, Kazuhiko; Takagi, Hideo; Nakata, Akira; and Kosaka, Shogo, 4,229,465, Cl. 424-274.000.

Takahashi, Eiichi: *See—*
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,229,570, Cl. 536-18.000.

Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigashi, Naofumi, to Seikisui Kagaku Kogyo Kabushiki Ltd. Coating method and article produced thereby. 4,229,495, Cl. 428-36.000.

Takahashi, Nobuaki; Funasaka, Eiichi; Shinozaki, Masanobu; and Kaizu, Yasuo, to Victor Company of Japan, Limited. Method and apparatus for driving a multi way speaker system. 4,229,619, Cl. 179-1.00D.

Takahashi, Susumu; and Chikashige, Tadaaki, to Sansui Electric Co., Ltd. Differential amplifiers. 4,229,705, Cl. 330-258.000.

Takahashi, Yuji; and Masaki, Hisaji, to Canon Kabushiki Kaisha. Position and presence detecting device for stacked sheet members. 4,229,650, Cl. 250-223.00R.

Takaishi, Naotake; Inamoto, Yoshiaki; and Matsukane, Masamoto, to Kao Soap Company, Limited. Tricyclo-α,β-unsaturated aldehyde. 4,229,324, Cl. 252-522.00R.

Takaishi, Naotake: *See—*
Aigami, Koji; Inamoto, Yoshiaki; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,229,375, Cl. 260-563.00P.

Takamatsu, Jun: *See—*
Takeda, Renzo; Uchikawa, Sadao; Kurihara, Kunitoshi; Yamamoto, Masaaki; Yokomi, Michiro; Yamashita, Junichi; and Takamatsu, Jun, 4,229,258, Cl. 176-76.000.

Takaoki, Muneo: *See—*
Fujino, Masahiko; Nishimura, Osamu; and Takaoki, Muneo, 4,229,438, Cl. 424-177.000.

Takasago Perfumery Co., Ltd.: *See—*
Kobayashi, Toyohiko; Tsuruta, Haruki; and Yoshida, Toshio, 4,229,600, Cl. 568-820.000.

Takashima, Hiroaki: *See—*
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,229,221, Cl. 106-58.000.

Take, Hiroshi; Koyanagi, Katubumi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Additional electrode of electrochromic display and refreshing method for the same. 4,229,080, Cl. 350-357.000.

Takeca Chemical Industries, Ltd.: *See—*
Higashide, Eiji; Hatano, Kazunori; and Asai, Mitsuko, 4,229,533, Cl. 435-119.000.

Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; Nishimura, Osamu; and Takaoki, Muneo, 4,229,438, Cl. 424-177.000.
Imada, Akira; Kitano, Kazuaki; and Asai, Mitsuko, 4,229,436, Cl. 424-117.000.
Mori, Shoichi; Ikeda, Yorifumi; and Nishikawa, Kikuo, 4,229,292, Cl. 210-673.000.

Takeda, Keniti: *See—*
Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, 4,229,440, Cl. 424-180.000.

Takeda, Renzo; Uchikawa, Sadao; Kurihara, Kunitoshi; Yamamoto, Masaaki; Yokomi, Michiro; Yamashita, Junichi; and Takamatsu, Jun, to Hitachi, Ltd. Fuel assembly. 4,229,258, Cl. 176-76.000.

Takemoto, Yoshinori; Yasui, Toshihiro; Fujii, Kyoichi; Tanaka, Hiroshi; and Hirayama, Tatsuyuki, to Kyowa Hakko Kogyo Co., Ltd. Aluminum acetylsalicylate glutaminate. 4,229,446, Cl. 424-230.000.

Takeshita, Ryuzo. Apparatus for injecting a desired volume of liquid in liquid and gas-liquid chromatography. 4,228,922, Cl. 222-47.000.

Takeuchi, Noboru: *See—*
Inamura, Minoru; Takeuchi, Noboru; Inukai, Kazuhiro; Taninouchi, Kentaro; and Utsunomiya, Shin, 4,228,944, Cl. 228-198.000.

Takita, Hitoshi: *See—*
Usami, Seiji; Oota, Masanori; Takita, Hitoshi; and Hashizume, Hideyuki, 4,229,549, Cl. 525-76.000.

Takita, Kiyoshi: *See—*
Miwa, Tan; Kobayashi, Reisuke; and Takita, Kiyoshi, 4,229,539, Cl. 435-207.000.

Talbot Industries, Ltd.: *See—*
Koffski, Leonard E., 4,228,871, Cl. 182-184.000.

Talbot, James R., to Fiber Industries, Inc. Simulated spun-like ingrain yarn. 4,228,640, Cl. 57-208.000.

Tamai, Masayoshi, to Xerox Corporation. Ink jet head. 4,229,751, Cl. 346-140.00R.

Tamaru, Munetaka: *See—*
Watanabe, Minoru; and Tamaru, Munetaka, 4,228,644, Cl. 368-28.000.

Tan, Ewe H.: *See—*
Wolff, Siegfried; and Tan, Ewe H., 4,229,333, Cl. 260-23.70M.

Tanabe, Kaichi; Koga, Shigeto; and Maeda, Yoshinori, to Shinko-Pfaudler Company, Ltd. Device for separating suspended material from a fluid stream by specific gravity difference. 4,228,943, Cl. 228-182.000.

Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, to Fuji Electric Co., Ltd. Apparatus for controlling a coin sorting machine. 4,228,811, Cl. 133-3.00R.

Tanaka, Hiroshi: *See—*
Takemoto, Yoshinori; Yasui, Toshihiro; Fujii, Kyoichi; Tanaka, Hiroshi; and Hirayama, Tatsuyuki, 4,229,446, Cl. 424-230.000.

Tanaka, Masato: *See—*
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,229,381, Cl. 568-454.000.

Tanaka, Nobuyoshi: *See—*
Kawamura, Naoto; Iizuka, Kiyoshi; Tanaka, Nobuyoshi; Kuwayama, Tetsuro; Matsumoto, Kazuya; and Goshima, Takeshi, 4,229,750, Cl. 346-107.00R.

Tanaka, Nobuyuki: *See—*
Shibata, Yutaka; Tanaka, Nobuyuki; and Maruyama, Ichiro, 4,228,754, Cl. 114-74.00R.

Tanaka, Yasuo. Kite. 4,228,977, Cl. 244-153.00R.

Tanaka, Yoko: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,229,359, Cl. 260-397.200.

Tancrell, Roger H., to Raytheon Company. Fresnel focussed imaging system. 4,228,686, Cl. 73-626.000.

Tang, David Y.; and Foster, Arthur M., to Hooker Chemicals & Plastics Corp. Process for the production of 1-phenyl-3-(3-trifluoromethylphenyl)-2-propanone. 4,229,378, Cl. 568-313.000.

Tani, Yoshiki: *See—*
Yamada, Hideaki; Shimizu, Sakayu; and Tani, Yoshiki, 4,229,538, Cl. 435-193.000.

Taniguchi, Nobuyuki: *See—*
Yuasa, Yoshio; and Taniguchi, Nobuyuki, 4,229,088, Cl. 354-23.00D.

Taninouchi, Kentaro: *See—*
Inamura, Minoru; Takeuchi, Noboru; Inukai, Kazuhiro; Taninouchi, Kentaro; and Utsunomiya, Shin, 4,228,944, Cl. 228-198.000.

Tarragona Corbella, Francisco J. Safety door fastening. 4,229,030, Cl. 292-270.000.

Taylor, Chester J., to United States of America, Army. Cargo tiedown anchor means. 4,229,132, Cl. 410-115.000.

Taylor Diving & Salvage Co., Inc.: *See—*
Wallace, Kenneth W.; and Gaudiano, Anthony V., 4,229,120, Cl. 405-158.000.

Teague, Walter D., Jr.; and Sempliner, Arthur T. Anti-rotation arrangement for nutating fluid device. 4,229,150, Cl. 418-50.000.

Techno-Instruments Ltd.: *See—*
Avidan, Benjamin, 4,229,690, Cl. 323-24.000.

Technovators, Inc.: *See—*
Fisher, Glen W., 4,228,822, Cl. 138-46.000.

Teegen, Walter: *See—*
Linder, Ernst; Rembold, Helmut; Teegen, Walter; Kessler, Achill; and Ehmann, Roland, 4,229,147, Cl. 417-283.000.

Teijin Limited: *See—*
Adachi, Teruhiko; and Ikeda, Hitoshi, 4,229,500, Cl. 428-373.000.
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, 4,229,552, Cl. 525-437.000.

Teisseire, Paul J.; and Maupetit, Pierre, to Societe Anonyme Roure Bertrand Dupont. Nor-dehydropatchoulol. 4,229,323, Cl. 252-522.00R.

Tekno-Detaljer Sture Carlsson AB: *See*—
Lindstrom, Jan, 4,229,125, Cl. 406-137.000.
Tektronix, Inc.: *See*—
Sato, Shuichi; Yamaguchi, Tadanori; and Sachitano, Jack, 4,229,756, Cl. 357-42.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Guidoux, Loic B. Y., 4,229,825, Cl. 375-118.000.
Teledyne Industries, Inc.: *See*—
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,229,634, Cl. 200-302.000.
Teleflex Incorporated: *See*—
Wood, Robert A. R., 4,228,757, Cl. 114-150.000.
Teletype Corporation: *See*—
Bellino, Joseph A.; Feldy, Edmund C.; LaSpesa, Richard E.; and Ramig, Robert J., Jr., 4,229,617, Cl. 178-92.000.
Thomas, James W., Jr., 4,229,702, Cl. 328-110.000.
Temler, Jan S., to Domtar, Inc. High-yield semi-chemical carbonate pulping process. 4,229,251, Cl. 162-28.000.
Templin, Jackson R., to General Motors Corporation. Remote temperature measuring system with semiconductor junction sensor. 4,228,684, Cl. 73-362.0SC.
Tenneco Chemicals, Inc.: *See*—
Feldman, Martin L.; Goodman, Donald; Koral, Marvin; Miller, Robert S.; and Stanaback, Robert J., 4,229,569, Cl. 528-501.000.
Terwee, Thomas H. M.: *See*—
Nijhuis, Jan; and Terwee, Thomas H. M., 4,228,643, Cl. 57-297.000.
Texaco Development Corp.: *See*—
Cavitt, Stanley B., 4,229,321, Cl. 252-476.000.
Texaco Inc.: *See*—
Pitts, Robert W., Jr.; and Gillespie, Ronald G., 4,229,769, Cl. 358-285.000.
Sustek, Alvin J., Jr.; Frazier, Terry L.; and Daryl, Gregory, 4,228,855, Cl. 166-250.000.
Texas Instruments Incorporated: *See*—
Culley, Bobby G.; and Surtani, Kishin, 4,228,574, Cl. 29-25.130.
Frank, Steven N.; and Frank, James G., 4,229,490, Cl. 427-113.000.
Hynecek, Jaroslav, 4,229,752, Cl. 357-24.000.
Rhodes, Clifford C., 4,229,803, Cl. 364-787.000.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy Joseph P., to Exxon Research & Engineering Co. High unsaturation butyl rubbers with additives. 4,229,325, Cl. 260-5.000.
Theobald, Hans; Wuerzer, Bruno; and Kiehs, Karl, to BASF Aktiengesellschaft. Substituted alkoxyimino-pyridazones, their manufacture, and their use as herbicides. 4,229,205, Cl. 71-92.000.
Thibodeau, Leslie N., to RCA Corporation. Flyback transformer. 4,229,787, Cl. 363-126.000.
Thiel, Max: *See*—
Kampe, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,229,464, Cl. 424-274.000.
Thierry, Timothy T. Shaving apparatus. 4,228,586, Cl. 30-41.000.
Thir, Basil: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,229,554, Cl. 525-438.000.
Tholen, Paul: *See*—
Herschmann, Otto; Zernig, Norbert; Holthausen, Dieter; Stock, Hugo; and Tholen, Paul, 4,228,655, Cl. 60-602.000.
Thomas A. Schutz Co., Inc.: *See*—
Eckert, Ronald P., 4,228,903, Cl. 211-49.00D.
Thomas Broadbent & Sons Limited: *See*—
Jackson, Joseph F., 4,228,949, Cl. 233-7.000.
Thomas, James W., Jr., to Teletype Corporation. Circuit for detecting the relative occurrence of one signal among a plurality of signals. 4,229,702, Cl. 328-110.000.
Thomas, John A.: *See*—
Subramanian, Kohur N.; Bell, Malcolm C. E.; Thomas, John A.; and Nissen, Norman C., 4,229,270, Cl. 204-109.000.
Thomas, John F.: *See*—
Zeitter, Charles R.; and Thomas, John F., 4,228,898, Cl. 206-621.000.
Thomas, Rudolf: *See*—
Arold, Hermann; Elbe, Hans-Ludwig; Kranz, Eckart; Kramer, Wolfgang; Stetter, Jorg; Stolzer, Claus; and Thomas, Rudolf, 4,229,580, Cl. 548-262.000.
Thomas, Valerie L. Illusion transmitter. 4,229,761, Cl. 358-90.000.
Thommen, Werner F.; Fehr, Werner; and Korom, Arpad, to U.S. Philips Corporation. Integrated circuit having first and second internal circuits controlled by a common input terminal. 4,229,670, Cl. 307-360.000.
Thompson, James E.; and Mayfield, Robert L., to Deere & Company. Vibration attenuator seat. 4,228,984, Cl. 248-636.000.
Thompson, Jay F. Seismogram display and method. 4,229,810, Cl. 367-68.000.
Thompson Marine Corporation: *See*—
Granger, Steven T., 4,229,389, Cl. 261-122.000.
Thompson, Morice W.: *See*—
Bentley, John; Thompson, Morice W.; and Palluel, Auguste L. L., 4,229,339, Cl. 260-34.200.
Thomson-CSF: *See*—
d'Auria, Luigi; and Huignard, Jean-Pierre, 4,229,071, Cl. 350-150.000.
Hoet, Roger, 4,229,674, Cl. 313-348.000.
Mourier, Georges, 4,229,677, Cl. 315-3.600.
Rougeot, Henri, 4,229,736, Cl. 340-782.000.
Thomson, David J.; and Turner, Roland J., to Bell Telephone Laboratories, Incorporated. Digital clock phase recovery circuits for data receiver. 4,229,823, Cl. 375-113.000.
Tiedt, Larry M., to GTE Automatic Electric Laboratories Incorporated. Programmable power supply system. 4,229,665, Cl. 307-150.000.
Timex Corporation: *See*—
Eberhardt, Noel, 4,229,783, Cl. 362-352.000.
Ting, Vincent W.; and Evans, James M., to SCM Corporation. Aqueous dispersion of polyamino polyhydroxy polyether resinous adduct and acid-functional aminoplast for cathodic electrocoating. 4,229,335, Cl. 260-29.40R.
Tisma, Ilija. Automobile shelter apparatus. 4,228,622, Cl. 52-3.000.
Titzschkau, Klaus: *See*—
Braun, Dietrich; and Titzschkau, Klaus, 4,229,556, Cl. 525-445.000.
TMC Corporation: *See*—
Svoboda, Josef, 4,229,020, Cl. 280-618.000.
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A. Process for producing unsaturated hydrocarbons. 4,229,604, Cl. 585-445.000.
Tobias, Michael A.; and Lynch, Conrad L., to Mobil Oil Corporation. Linear polyester coil coating compositions. 4,229,555, Cl. 525-443.000.
Tobin, Thomas J., to S&C Electric Company. Diaphragm having a pattern of reduced thickness in a high voltage, circuit-interrupting device. 4,229,723, Cl. 337-275.000.
Tocchella, Antonio: *See*—
Zinno, Oscar; and Tocchella, Antonio, 4,229,034, Cl. 294-81.0SF.
Tocci, Anthony J., to RCA Corporation. Cleaving apparatus. 4,228,937, Cl. 225-96.500.
Toda, Tadayoshi, to Nissan Motor Company, Limited. Pillar garnish. 4,229,036, Cl. 296-202.000.
Toffanetti, Erio: *See*—
Vigano, Carlo; Quattrone, Francesco; and Toffanetti, Erio, 4,229,645, Cl. 235-92.0QC.
Togashi, Akira. Tubular body. 4,228,852, Cl. 165-173.000.
Toho Beslon Co., Ltd.: *See*—
Fukuta, Kenji; Ono-Oka, Ryuzo; Yoshida, Masatoshi; Saito, Kazuhisa; and Kosuda, Hiroyuki, 4,229,397, Cl. 264-113.000.
Toho Gasu Kabushiki Kaisha: *See*—
Yamaguchi, Yukio; Ishihara, Kenji; and Yonekura, Kikuo, 4,229,341, Cl. 260-42.160.
Toke, Laszlo; Szabo, Gabor T.; Szabo, Gabor; Nagy, Lajos; and Rusznak, Istvan, to Chinoin Gyogyszer es Vegyeszeti Termeker Gyara Rt. Process for heterogeneous nucleophilic substitution reactions. 4,229,366, Cl. 260-465.00F.
Tokico Ltd.: *See*—
Haraikawa, Tetsuo; and Hasaka, Tomio, 4,228,875, Cl. 188-72.700.
Tokuda, Katumi: *See*—
Mitani, Yutaka; Tokuda, Katumi; and Kitao, Saburo, 4,229,786, Cl. 363-126.000.
Tokyo Print Industry Co., Ltd.: *See*—
Arai, Minoru, 4,228,582, Cl. 29-650.000.
Tolbert, William R.; Feder, Joseph; and Kuo, Mau-Jung, to Monsanto Company. Production of tumor angiogenesis factor by cell culture. 4,229,531, Cl. 435-41.000.
Tolbert, William R.; and Feder, Joseph, to Monsanto Company. Production of tumor angiogenesis factor by cell culture. 4,229,532, Cl. 435-41.000.
Tomisawa, Takeshi: *See*—
Ohmukai, Yoshimi; Tomisawa, Takeshi; and Kawasaki, Yoshitaka, 4,229,159, Cl. 431-328.000.
Tomita, Kenkichi: *See*—
Ichikawa, Atsushi; Tomita, Kenkichi; Horiuchi, Taku; Suzuki, Shin-ichi; and Sakuma, Akira, 4,229,471, Cl. 424-320.000.
Tonomura, Kenzo; and Urakami, Teizi, to Agency of Industrial Science & Technology; Ministry of International Trade and Industry; and Mitsubishi Gas Chemical Company, Inc. Process for culturing methanol-utilizing yeasts. 4,229,543, Cl. 435-245.000.
Toole Energy Company, Inc.: *See*—
Ballantyne, James W., 4,229,122, Cl. 405-258.000.
Torok, Ernest J.; Fleming, David L.; and Johansen, Thomas R., to Sperry Rand Corporation. Color display system using magneto-optic screen having a dispersive Faraday coefficient. 4,229,072, Cl. 350-151.000.
Torre, Arturo D.: *See*—
Melloni, Piero; Torre, Arturo D.; Carniel, Giovanni C.; and Rossi, Alessandro, 4,229,449, Cl. 424-248.580.
Torretta, Roberto: *See*—
Ruscitti, Tommaso; Albini, Giovanni; and Torretta, Roberto, 4,228,931, Cl. 222-321.000.
Tothfalusi, Miklos, to Coal Industry (Patents) Limited. Particulate material loading equipment. 4,228,890, Cl. 198-514.000.
Toussaint, Herbert; Adelsberger, Klaus; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Production of hexamethylenimine. 4,229,346, Cl. 260-239.00B.
Toyo Boseki Kabushiki Kaisha: *See*—
Suzuki, Hajime; Hamada, Hiroyuki; and Ichikawa, Rinjiro, 4,229,498, Cl. 428-212.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Yoshida, Hiroshi; Tabara, Nobuo; and Aoki, Keiji, 4,229,793, Cl. 364-431.000.

Tractell S.A.: *See*—
Cavalieri, Michel, 4,228,989, Cl. 254-384.000.
Trampe, Stanley F. Prefabricated panel module construction. 4,228,626, Cl. 52-275.000.
Trancik, Edward R., to Ford Motor Company. Spark plug with low erosion electrode tip. 4,229,672, Cl. 313-139.000.
Travis, Terence, to International Business Machines Corporation. Automatic copy recovery. 4,229,100, Cl. 355-77.000.
Tregubenko, Viktor V.: *See*—
Shushlebin, Boris A.; Lyakishev, Nikolai P.; Tregubenko, Viktor V.; Ignatenko, Gennady F.; and Subbotin, Nikolai I., 4,229,214, Cl. 75-133.000.
Treitz, Gerd. Ladder. 4,228,872, Cl. 182-194.000.
Tremba, Joseph A., to Eaton Corporation. Tire pressure monitor. 4,229,728, Cl. 340-58.000.
Trevisson, Renato; and Pizzocri, Guido, to Alfa Romeo S.p.A. Collapsible-steering unit for motor vehicles. 4,228,695, Cl. 74-492.000.
Tri-County Elevator Co., Inc.: *See*—
Nyborg, George L., Jr., 4,228,873, Cl. 187-61.000.
Trias, John A.: *See*—
Schimitschek, Erhard J.; Celto, John E.; and Trias, John A., 4,229,711, Cl. 331-94.50P.
Trickel, Lorn L. Braking apparatus for dog track rabbit lure car. 4,228,998, Cl. 272-4.000.
Trost, Wayne C., to Barber-Colman Company. Heddle for a weaving machine for making triaxial fabrics. 4,228,827, Cl. 139-93.000.
Trott, William A., to Medical Products Institute Incorporated. Self-inflating and self-cleaning catheter assembly. 4,228,802, Cl. 128-349.00R.
Trub, Hermann B.: *See*—
Cole, Donald G.; Hartmann, Achim; Kulling, Achim M.; and Trub, Hermann B., 4,229,399, Cl. 264-117.000.
Trui, Josef: *See*—
Ritter, Ernst; Trui, Josef; and Kramer, Manfred, 4,228,774, Cl. 123-562.000.
TRW Inc.: *See*—
Harrington, Alan L., 4,229,474, Cl. 428-162.000.
Hodge, Malcolm H.; and Dunn, William M., 4,229,068, Cl. 350-96.200.
Jones, Robert J.; Vaughan, Robert W.; Buyny, Robert A.; and O'Rell, Michael K., 4,229,550, Cl. 525-282.000.
Vetter, Ottomar H.; and Hanlon, Terrance W., 4,229,064, Cl. 339-186.00M.
Tschentscher, Alfred: *See*—
Heim, Richard; Hermanns, Peter; and Tschentscher, Alfred, 4,228,965, Cl. 242-45.000.
Tschopp, Paul: *See*—
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,229,577, Cl. 548-138.000.
Tsubaki, Kazumi: *See*—
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, 4,229,552, Cl. 525-437.000.
Tsuda, Masataka: *See*—
Shigematsu, Taichiro; Yoshida, Kenji; Nakazawa, Makoto; Kasugai, Hiroshi; and Tsuda, Masataka, 4,229,461, Cl. 424-270.000.
Tsuda, Shin: *See*—
Kurahayashi, Sadasuke; Kato, Yuzo; Watanabe, Asao; Tsuda, Shin; and Muto, Hakaru, 4,229,768, Cl. 358-261.000.
Tsuji, Takao; Goshima, Takeshi; and Sato, Hideaki, to Canon Kabushiki Kaisha. Optical high density FM recording device with corrective signal. 4,229,763, Cl. 358-128.500.
Tsumura, Haruo: *See*—
Oura, Maremi; Tsumura, Haruo; and Kubota, Hayato, 4,229,483, Cl. 426-250.000.
Tsunasawa, Masami: *See*—
Suzuki, Takami; Iwata, Nobuo; and Tsunasawa, Masami, 4,228,577, Cl. 29-418.000.
Tsunawaki, Kiyokazu: *See*—
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, 4,229,552, Cl. 525-437.000.
Tsunoda, Teruo: *See*—
Nagashiro, Waichi; Fukke, Hajime; Kato, Yoshiki; Tsunoda, Teruo; Kobayashi, Teruaki; Oba, Yoichi; Chiba, Katsuyoshi; Mitsuya, Munehisa; Ishihara, Heigo; and Endo, Mitsushi, 4,229,312, Cl. 252-62.540.
Tsurumi, Michio: *See*—
Kai, Tamotsu; Tsurumi, Michio; Sakakiyama, Takashi; and Horiuchi, Kunihiro, 4,229,507, Cl. 428-541.000.
Tsuruoka, Takashi: *See*—
Sekizawa, Yasuharu; Tsuruoka, Takashi; Hachisu, Mitsugu; Sezaki, Masaji; Miyamoto, Masashi; Shibata, Uichi; Mizutani, Kazuko; Inouye, Shigeharu; Koeda, Takemi; Shimomura, Keizo; and Niida, Taro, 4,229,448, Cl. 424-245.000.
Tsuruta, Haruki: *See*—
Kobayashi, Toyohiko; Tsuruta, Haruki; and Yoshida, Toshio, 4,229,600, Cl. 568-820.000.
Tuckerman, Louis B., III: *See*—
Matyas, Stephen M.; Meyer, Carl H. W.; and Tuckerman, Louis B., III, 4,229,818, Cl. 375-2.000.
Tulenko, Thomas N.; and Di Camillo, Carmen A., to Tulenko, Thomas N. Exposure detecting device. 4,229,733, Cl. 340-500.000.
Tuller, Clarence J., to General Electric Company. Floodlight reflector mounting. 4,229,785, Cl. 362-433.000.
Tummers, Gerardus L. J.: *See*—
Lilly, Robert L.; Tummers, Gerardus L. J.; Johnson, Claude D.; and Davis, Roger D., 4,229,813, Cl. 368-89.000.
Tumminaro, Anthony J. Toilet for animals. 4,228,554, Cl. 119-1.000.
Turner, Richard L. Oil well pump. 4,229,149, Cl. 417-554.000.
Turner, Roland J.: *See*—
Thomson, David J.; and Turner, Roland J., 4,229,823, Cl. 375-113.000.
Turner, Ronald L.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,229,209, Cl. 75-1.00R.
Tweeton, Timothy J. Baby bottle carrier. 4,228,908, Cl. 215-11.00C.
Tyler, Derek E.: *See*—
Winter, Joseph; Tyler, Derek E.; and Pryor, Michael J., 4,229,210, Cl. 75-10.00R.
Tyson, Henry K.: *See*—
Wikelski, Karl W.; and Tyson, Henry K., 4,229,011, Cl. 277-72.0FM.
UBE Industries, Ltd.: *See*—
Nishimura, Kenji; Uchiumi, Shinichiro; Fujii, Kozo; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,229,589, Cl. 560-193.000.
Nishimura, Kenji; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Uchiumi, Shinichiro, 4,229,591, Cl. 560-193.000.
Uchida, Yoshio: *See*—
Murofushi, Mitsugu; Sasaki, Kuniaki; Shiomi, Michio; Uchida, Yoshio; Hattori, Tokihisa; and Takeda, Keniti, 4,229,440, Cl. 424-180.000.
Uchikawa, Sadao: *See*—
Takeda, Renzo; Uchikawa, Sadao; Kurihara, Kunitoshi; Yamamoto, Masaaki; Yokomi, Michiro; Yamashita, Junichi; and Takamatsu, Jun, 4,229,258, Cl. 176-76.000.
Uchiumi, Shinichiro: *See*—
Nishimura, Kenji; Uchiumi, Shinichiro; Fujii, Kozo; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,229,589, Cl. 560-193.000.
Nishimura, Kenji; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Uchiumi, Shinichiro, 4,229,591, Cl. 560-193.000.
Uchiyama, Yasuji; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Key code data generator. 4,228,712, Cl. 84-1.010.
Ueda, Hirotada; and Ihara, Satoshi, to Displaytek Corporation; and Daiwa Shinku Corporation. Electrostatic display device. 4,229,075, Cl. 350-269.000.
Ueda, Hirozo, to Fuji Photo Film Co., Ltd. Process for improving image-sharpness of photographic silver halide material. 4,229,525, Cl. 430-568.000.
Uede, Hisashi: *See*—
Take, Hiroshi; Koyanagi, Katubumi; and Uede, Hisashi, 4,229,080, Cl. 350-357.000.
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, to Nippon Oil Co., Ltd.; and Shinagawa Refractories Co., Ltd. Method for producing refractories. 4,229,221, Cl. 106-58.000.
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of producing nitrogen-containing polysaccharides. 4,229,570, Cl. 536-18.000.
Uerdingen, Walter: *See*—
Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, 4,228,683, Cl. 73-204.000.
Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, 4,228,815, Cl. 137-10.000.
Umehara, Yozaburu. Tape guide means for recording and/or reproducing apparatus and method of manufacturing the same. 4,228,940, Cl. 226-196.000.
Underwood, J. Larry. Stacking element for retaining stacked articles. 4,228,897, Cl. 206-504.000.
Union Carbide Corporation: *See*—
Cotter, Robert J.; and Gardner, Hugh C., 4,229,559, Cl. 526-271.000.
Gardner, Hugh C.; and Matzner, Markus, 4,229,565, Cl. 528-176.000.
Reed, Denvil E.; and Grimm, Richard C., 4,229,262, Cl. 203-29.000.
Unit Process Assemblies, Inc.: *See*—
Weinstock, Jacques; Lieber, Derek; and Hay, William D., 4,229,652, Cl. 250-308.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Warner, Richard T., 4,228,598, Cl. 35-10.400.
United States of America
Air Force: *See*—
Evers, Robert C.; Arnold, Fred E.; and Helminiak, Thaddeus E., 4,229,566, Cl. 528-185.000.
Army: *See*—
Bly, Vincent T.; and Depersia, Anthony T., 4,229,078, Cl. 350-353.000.
Campbell, Robert T., 4,229,738, Cl. 343-7.300.
Hirata, Tetsuyuki, 4,228,689, Cl. 73-747.000.
Jones, Terry L.; and Miller, Brian S., 4,229,081, Cl. 350-361.000.
Meinzer, Richard A., 4,229,712, Cl. 331-94.50D.
Mertwoy, Abraham, 4,228,674, Cl. 73-10.000.
Taylor, Chester J., 4,229,132, Cl. 410-115.000.
Energy: *See*—
Babad, Harry; and Strachan, Denis M., 4,229,317, Cl. 252-301.10W.

Gregg, David W., 4,229,184, Cl. 48-62.00R.
Johnson, Carl E.; and Crouthamel, Carl E., 4,229,260, Cl. 176-82.000.
Lewis, Robert N., 4,229,704, Cl. 328-233.000.
Marchant, David D.; and Bates, J. Lambert, 4,229,322, Cl. 252-521.000.
Federal Communications Commission: *See*—
Luedtke, Arthur; and Bentley, William F., 4,229,744, Cl. 343-769.000.
Health, Education and Welfare: *See*—
Ito, Yoichiro, 4,228,950, Cl. 233-25.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
MacGlashan, William F., Jr. Power control for hot gas engines. 4,228,656, Cl. 60-518.000.
Shaw, Graham C. Recovery of aluminum from composite propellants. 4,229,182, Cl. 23-293.00R.
National Aeronautics and Space Administration: *See*—
Elber, Wolf, 4,229,473, Cl. 428-113.000.
Woollam, John A., 4,229,196, Cl. 62-40.000.
Navy: *See*—
Davis, Sydney; and Durkin, John M., 4,228,753, Cl. 114-67.00A.
Holloway, Jack W., 4,229,812, Cl. 367-158.000.
Schimitschek, Erhard J.; Celto, John E.; and Trias, John A., 4,229,711, Cl. 331-94.50P.
Vaselich, Raymond A.; and Dixon, John, Jr., 4,229,659, Cl. 250-554.000.
Villarruel, Carl A.; and Giallorenzi, Thomas G., 4,229,402, Cl. 264-262.000.
U.S. Philips Corporation: *See*—
Breed, Dirk J., 4,229,805, Cl. 365-2.000.
de Jager, Frank; Dekker, Cornelis B.; and Muilwijk, Dirk, 4,229,821, Cl. 375-53.000.
Eggermont, Ludwig D. J., 4,229,802, Cl. 364-786.000.
Goddijn, Bernardus H. A., 4,229,682, Cl. 318-254.000.
Heijnemans, Werner A. L.; Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., 4,229,720, Cl. 335-213.000.
Moussie, Michel, 4,229,757, Cl. 357-59.000.
Thommen, Werner F.; Fehr, Werner; and Korom, Arpad, 4,229,670, Cl. 307-360.000.
United States Steel Corporation: *See*—
Pringle, William L., 4,228,572, Cl. 29-157.30R.
United Technologies Corporation: *See*—
Arnold, Joe F.; Browning, Robert G.; and Meinzer, Richard A., 4,229,158, Cl. 431-178.000.
Camp, Vann T., 4,228,650, Cl. 60-39.09R.
Wayne, Robert J.; and Henschke, Robert W., 4,229,079, Cl. 350-356.000.
Unitika Ltd.: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Kishida, Minolu, 4,229,332, Cl. 260-22.00T.
Universal Sewer Pipe Company: *See*—
Gray, Paul E., 4,229,028, Cl. 285-235.000.
UOP Inc.: *See*—
Antos, George J., 4,229,319, Cl. 252-441.000.
Auck, Yoon T., 4,229,213, Cl. 75-103.000.
DeFilippi, Louis J., 4,229,536, Cl. 435-176.000.
Habdas, Edward P.; and Aaron, Jon D., 4,229,275, Cl. 204-195.00S.
Luetzow, Howard J., 4,229,256, Cl. 176-36.00S.
Ward, Dennis J., 4,229,586, Cl. 560-98.000.
Uozumi, Takahiro: *See*—
Ohta, Hideyasu; Shirasaki, Jun; Kanbe, Masaru; Abe, Naoto; Uozumi, Takahiro; and Mayama, Masayoshi, 4,229,523, Cl. 430-532.000.
Upjohn Company, The: *See*—
Nelson, Norman A., 4,229,377, Cl. 568-380.000.
Urakami, Teizi: *See*—
Tonomura, Kenzo; and Urakami, Teizi, 4,229,543, Cl. 435-245.000.
Urban, Manfred: *See*—
Spietschka, Ernst; and Urban, Manfred, 4,229,583, Cl. 549-52.000.
Usami, Seiji; Oota, Masanori; Takita, Hitoshi; and Hashizume, Hideyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition comprising a rigid thermoplastic resin and a graft copolymer. 4,229,549, Cl. 525-76.000.
Usbeck, Gerhard, to Hoechst Aktiengesellschaft. Process for anodically oxidizing aluminum and use of the material so prepared as a printing plate support. 4,229,266, Cl. 204-33.000.
Usov, Vladimir V.: *See*—
Anichkov, Andrei D.; Polonsky, Jury Z.; and Usov, Vladimir V., 4,228,799, Cl. 128-303.00B.
Utah Research & Development Corporation: *See*—
Newman, William A., 4,229,687, Cl. 320-2.000.
Uthe, Edward E., to SRI International. Method and apparatus for monitoring particulate mass concentration of emissions from stationary sources. 4,229,653, Cl. 250-339.000.
Utsunomiya, Shin: *See*—
Inamura, Minoru; Takeuchi, Noboru; Inukai, Kazuhiro; Taninouchi, Kentaro; and Utsunomiya, Shin, 4,228,944, Cl. 228-198.000.
Vaill, Ronald E.; and Phillips, William D., to Westinghouse Electric Corp. Grid sleeve bulge tool. 4,229,259, Cl. 176-78.000.
Vaisala Oy: *See*—
Antikainen, Veijo; and Reittu, Osmo, 4,229,776, Cl. 361-283.000.
Valmet Oy: *See*—
Heinola, Reino, 4,228,849, Cl. 165-39.000.
Lehtinen, Antti, 4,229,250, Cl. 162-23.000.
Vamvakas, Michael, to Niagara Bottle Washer Manufacturing Co. Rotary bottle discharge apparatus. 4,228,887, Cl. 198-408.000.
Vander Molen, Gordon L.: *See*—
Haben, Dale E.; Kepley, Garry D.; and Vander Molen, Gordon L., 4,229,624, Cl. 179-18.00E.
Vandervell Products Limited: *See*—
Howse, Ronald N., 4,229,057, Cl. 308-161.000.
Vanderzee, Robert S., to Steelastic Company, The. Building drum assembly. 4,229,246, Cl. 156-417.000.
Van Horne, Arthur C., to Dataproducts Corporation. Mechanism for operator-replaceable printhead. 4,229,114, Cl. 400-692.000.
Van Kirk, James W.: *See*—
Wheaton, Robert B.; and Van Kirk, James W., 4,229,296, Cl. 210-758.000.
Van Rens, Russell J., to Outboard Marine Corporation. Side port - RC engine. 4,229,151, Cl. 418-61.00A.
van Soest, Hendrikus J. J.: *See*—
Breuers, Theo P. C.; Heijnen, Andreas T.; and van Soest, Hendrikus J. J., 4,228,995, Cl. 271-292.000.
Varian Associates, Inc.: *See*—
Bustin, Raphael, 4,229,703, Cl. 328-162.000.
Varner, James P., to Eaton Corporation. Irrigation system and fluid dispersion nozzle. 4,228,956, Cl. 239-237.000.
Vaselich, Raymond A.; and Dixon, John, Jr., to United States of America, Navy. Oxidizer burn through detector with majority voting network. 4,229,659, Cl. 250-554.000.
Vasiliev, Gavril I.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.
Vaughan, Robert W.: *See*—
Jones, Robert J.; Vaughan, Robert W.; Buyny, Robert A.; and O'Rell, Michael K., 4,229,550, Cl. 525-282.000.
Vecchietti, Vittorio: *See*—
Ferrari, Giorgio; and Vecchietti, Vittorio, 4,229,450, Cl. 424-248.520.
Velsicol Chemical Corporation: *See*—
Lazar, Remus I.; and Reichel, Richard C., 4,229,177, Cl. 8-435.000.
Lazar, Remus I.; and Reichel, Richard C., 4,229,178, Cl. 8-583.000.
Vending Components, Inc.: *See*—
Gross, Charles, 4,228,929, Cl. 222-185.000.
Vepa AG: *See*—
Fleissner, Heinz, 4,229,173, Cl. 8-519.000.
Vermeulen-Hollandia Octrooien B.V.: *See*—
Vermeulen, Theodorus H., 4,229,037, Cl. 296-216.000.
Vermeulen, Theodorus H., to Vermeulen-Hollandia Octrooien B.V. Vehicle, provided with a sliding roof assembly. 4,229,037, Cl. 296-216.000.
Versar, Inc.: *See*—
Shaver, Robert G.; and Leake, William R., 4,229,425, Cl. 423-449.000.
Vertenstein, Mathieu J.: *See*—
Price, Frank B.; and Vertenstein, Mathieu J., 4,229,279, Cl. 204-297.00R.
Vetco Inc.: *See*—
Nobileau, Philippe C., 4,228,857, Cl. 166-341.000.
Vetter, Ottomar H.; and Hanlon, Terrance W., to TRW Inc. Polarizing adapter sleeves for electrical connectors. 4,229,064, Cl. 339-186.00M.
Vianova Kunstharz, A.G.: *See*—
Zuckert, Bertram, 4,229,331, Cl. 260-20.000.
Victor Company of Japan, Limited: *See*—
Muramatsu, Hiroshi, 4,229,772, Cl. 360-69.000.
Takahashi, Nobuaki; Funasaka, Eiichi; Shinozaki, Masanobu; and Kaizu, Yasuo, 4,229,619, Cl. 179-1.00D.
Victor Fluid Power: *See*—
Nelson, David J., 4,228,818, Cl. 137-115.000.
Victor, John G., to Institute of Gas Technology. Fluidized bed apparatus and process. 4,229,289, Cl. 209-474.000.
Vidler, James W. Harmonica playing means. 4,228,720, Cl. 84-377.000.
Vieweg, Gunther; and Sturzl, Wilhelm, to Siemens Aktiengesellschaft. Electronic maximum measuring device. 4,229,795, Cl. 364-483.000.
Vigano, Carlo; Quattrone, Francesco; and Toffanetti, Erio, to Anic S.p.A.; and Costruzioni Elettriche Automatiche Impianti (C.E.A.I). Detector and recorder of holes and disruptions in plastic material sheets and webs. 4,229,645, Cl. 235-92.0QC.
Villarruel, Carl A.; and Giallorenzi, Thomas G., to United States of America, Navy. Fiber optic connection method. 4,229,402, Cl. 264-262.000.
Vinals, Joaquin F.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,229,599, Cl. 568-819.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,229,314, Cl. 252-174.110.
Vink, Nicolaas G.: *See*—
Heijnemans, Werner A. L.; Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., 4,229,720, Cl. 335-213.000.
Vinz, Siegfried. Method and apparatus for redistributing heat within a room. 4,228,661, Cl. 62-89.000.
Vo, Thang; and Lewis, John R., Jr., to Shakespeare Company. Multiple band, multiple resonant frequency antenna. 4,229,743, Cl. 343-749.000.

Vock, Manfred H.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,229,599, Cl. 568-819.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,229,314, Cl. 252-174.110.

Voest-Alpine Aktiengesellschaft: *See*—
Scheurecker, Werner, 4,228,844, Cl. 164-448.000.

Vogel, Hans H., to Schweizerische Lokomotiv-und Maschinenfabrik. Transversely interconnected trucks. 4,228,740, Cl. 105-168.000.

Vogler, Alfred: *See*—
Kisters, Theodor; and Vogler, Alfred, 4,229,411, Cl. 422-62.000.

Vogt, Ernst: *See*—
Corti, Christopher W.; Luthi, Rolf; and Vogt, Ernst, 4,228,670, Cl. 72-42.000.

Voinova, Galina J.: *See*—
Morin, Boris P.; Voinova, Galina J.; Breusova, Irina P.; Stanchenko, Galina I.; and Rogovin, Zakhar A., 4,229,326, Cl. 260-8.000.

Volgstadt, Frank R.; and Passerell, David P., to Perfection Corporation. Stab-type coupling. 4,229,025, Cl. 285-105.000.

Volpe, Richard L., to White Consolidated Industries, Inc. Variable jogger for a sheet feeder. 4,228,994, Cl. 271-250.000.

Vosbikian, Michael. Shovel with auxiliary handle. 4,229,033, Cl. 294-58.000.

Vsesojuzny Institut Experimentalnoi Veterinarii: *See*—
Sarkisov, Arutjun K.; and Petrovich, Svyatoslav V., 4,229,434, Cl. 424-88.000.

Vulmiere, Huguette N.; and Vulmiere, Jacques C., to Agence Nationale de Valorisation de la Recherche (ANVAR). Apparatus for the photographic reproduction of transparent documents. 4,229,097, Cl. 355-35.000.

Vulmiere, Jacques C.: *See*—
Vulmiere, Huguette N.; and Vulmiere, Jacques C., 4,229,097, Cl. 355-35.000.

W. F. Altenpohl, Inc.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,228,635, Cl. 53-572.000.

W. R. Grace & Co.: *See*—
Mueller, Walter B., 4,229,241, Cl. 156-243.000.
Siemer, Sidney R., 4,229,203, Cl. 71-86.000.
Siemer, Sidney R., 4,229,206, Cl. 71-93.000.

W. Sanderson & Sons S.p.A.: *See*—
Canton, Mario D.; and Bonfiglio, Andrea, 4,228,732, Cl. 99-509.000.

Wabash, Inc.: *See*—
Kiess, Ronald J., 4,228,780, Cl. 123-596.000.

Wachi, Tsuneo: *See*—
Miyao, Kohei; Ito, Yoshitaka; and Wachi, Tsuneo, 4,229,468, Cl. 424-287.000.

Wada, Norinobu; and Shirota, Yoshihiro, to Shin-Etsu Chemical Co., Ltd. Method of discharging gaseous vinyl chloride monomer from a polymerization reactor. 4,229,568, Cl. 528-500.000.

Wada, Toshihiko: *See*—
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,229,570, Cl. 536-18.000.

Wadkinson, George W., Jr., to Grumman Energy Systems, Inc. Leak detection for coaxial heat exchange system. 4,228,848, Cl. 165-11.00R.

Wafer, John A.; and Maier, Alfred E., to Westinghouse Electric Corp. Circuit breaker utilizing improved arc chambers. 4,229,630, Cl. 200-144.00B.

Wagenseller, George L. Solar heating system. 4,228,785, Cl. 126-422.000.

Wagner, Edmund: *See*—
Ruffer, Dittmar; and Wagner, Edmund, 4,228,625, Cl. 52-223.00R.

Wagner, Hans M.: *See*—
Sharp, Gerald B.; Petrak, Karel L.; Boielle, John H.; Wagner, Hans M.; and Langford, John F., 4,229,519, Cl. 430-287.000.

Wagor, John C., to Kwik-Way Manufacturing Company. Valve surfacing machine with variable speed chuck. 4,228,621, Cl. 51-241.0VS.

Wahlefeld, August W.: *See*—
Ziegenhorn, Joachim; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; and Bergmeyer, Hans U., 4,229,527, Cl. 435-11.000.

Wajs, Georges H., to Essilor International Compagnie Generale d'Optique. Method for preparing silicone graft copolymers. 4,229,273, Cl. 204-159.130.

Wakunaga Yakuhin Kabushiki Kaisha: *See*—
Tabushi, Iwao; Sugimoto, Hiroyuki; and Yazaki, Akira, 4,229,356, Cl. 260-396.00K.

Walch, Axel; Wildhardt, Jurgen; and Beissel, Dieter, to Hoechst Aktiengesellschaft. Permselective membrane and use. 4,229,291, Cl. 210-23.00F.

Wallace, Charles H.; and Moncure, Richard W., to International Telephone and Telegraph Corporation. Methods for computer assisted optimization of meat cuts from carcasses. 4,228,685, Cl. 73-432.00R.

Wallace, Kenneth W.; and Gaudiano, Anthony V., to Taylor Diving & Salvage Co., Inc. Submarine pipeline alignment rig. 4,229,120, Cl. 405-158.000.

Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,229,055, Cl. 308-26.000.

Wanzer, C. L. Wide band impedance matching device. 4,229,826, Cl. 455-83.000.

Ward, Dennis J., to UOP Inc. Process for production of motor fuel and phthalate esters or acyclic alcohols. 4,229,586, Cl. 560-98.000.

Wareham, Richard R.: *See*—
Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., 4,229,090, Cl. 354-86.000.

Warner-Lambert Company: *See*—
Butler, Donald E., 4,229,457, Cl. 424-263.000.

Warner, Paul L., Jr.; and Luber, Edward J., Jr., to Westwood Pharmaceuticals, Inc. Treatment of inflammatory disorders with 4-trifluoromethylimidazo[1,2-a]quinoxaline. 4,229,452, Cl. 424-250.000.

Warner, Richard T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Radar simulation apparatus. 4,228,598, Cl. 35-10.400.

Washington Steel Corporation: *See*—
Kotler, Richard G.; and Bricmont, Francis H., 4,229,162, Cl. 432-6.000.

Wasserstein, Linda J.: *See*—
Crandall, William B.; and Wasserstein, Linda J., 4,229,494, Cl. 428-35.000.

Watanabe, Asao: *See*—
Kurahayashi, Sadasuke; Kato, Yuzo; Watanabe, Asao; Tsuda, Shin; and Muto, Hakaru, 4,229,768, Cl. 358-261.000.

Watanabe, Hirozi: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,228,932, Cl. 222-368.000.

Watanabe, Kenkichi, to Laurel Bank Machine Co., Ltd. Coin guide chute device for coin packing machine. 4,228,632, Cl. 53-54.000.

Watanabe, Kikuo; Kazino, Mitsutaka; and Yamazaki, Hisashi, to Brother Kogyo Kabushiki Kaisha. Device for controlling the movement of a movable member. 4,229,683, Cl. 318-466.000.

Watanabe, Masanori: *See*—
Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; Onda, Eiichi; and Nemoto, Ichiro, 4,229,093, Cl. 354-266.000.

Watanabe, Minoru; and Tamaru, Munetaka, to Citizen Watch Co., Ltd. Display device for calendar timepieces. 4,228,644, Cl. 368-28.000.

Watarai, Syu; Sawada, Kenichi; and Saida, Takeshi, to Fuji Photo Film Co., Ltd. Photoconductive polymer material of N-alkylphenothiazine and formaldehyde. 4,229,510, Cl. 430-38.000.

Watkins, Ronald C. Method and apparatus for burning or dodging preselected portions of an image formed on photographic paper. 4,229,099, Cl. 355-71.000.

Watzka, Roland; and Bartholme, Henri, to SIG Schweizerische Industrie-Gesellschaft. Separator device for elongate objects advancing along a conveying path. 4,228,901, Cl. 209-684.000.

Waugh, Dale L.: *See*—
Jacob, Richard J.; and Waugh, Dale L., 4,228,692, Cl. 474-251.000.

Wawra, Georg: *See*—
Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, 4,228,683, Cl. 73-204.000.
Juffa, Richard; Wawra, Georg; and Uerdingen, Walter, 4,228,815, Cl. 137-10.000.

Wayne, Robert J.; and Henschke, Robert W., to United Technologies Corporation. Electro-optic modulator with improved acousto-optic suppression, heat transfer and mechanical support. 4,229,079, Cl. 350-356.000.

Weaver, Charles S., Jr., to Peerless Pottery, Inc. Bathtub wall-surround. 4,228,552, Cl. 52-35.000.

Weaver, Marvin P., to Robertshaw Controls Company. Valve construction having multiple piston means. 4,228,817, Cl. 137-79.000.

Webb, J. Talmadge: *See*—
Yates, August B., 4,228,974, Cl. 244-224.000.

Weber, Kurt, to Rieter Machine Works Ltd. Drive apparatus of a can for depositing textile fibre slivers. 4,228,563, Cl. 19-159.00R.

Webster, David F. Method for recording the walking ability of an individual. 4,228,599, Cl. 35-29.00R.

Wedman, Martin. Truck mounted cattle control box. 4,228,766, Cl. 119-103.000.

Weidmann, Erich: *See*—
Loepfe, Erich; and Weidmann, Erich, 4,228,828, Cl. 139-370.200.

Weikel, Maurice M. Dental amalgam dispenser. 4,228,919, Cl. 221-96.000.

Weimer, Dean R.; and Starks, Charles M., to Conoco, Inc. Chemicals for treatment of PVC. 4,229,598, Cl. 568-792.000.

Weingardt, Rolf E., to Standard Container Company. Plastic paint bucket with metal sealing ring. 4,228,916, Cl. 220-354.000.

Weinstock, Jacques; Lieber, Derek; and Hay, William D., to Unit Process Assemblies, Inc. Backscatter apparatus and method for measuring thickness of a continuously moving coated strip of substrate material. 4,229,652, Cl. 250-308.000.

Weiss, Gerhart. Timing device. 4,228,649, Cl. 368-93.000.

Welge, Frederick T.: *See*—
Redmore, Derek; and Welge, Frederick T., 4,229,294, Cl. 210-700.000.

Wellworthy Limited: *See*—
Speaight, David C.; and Longfoot, Gerald, 4,228,727, Cl. 92-228.000.

Wenzel, Franz; Schoedel, Ulrich; Jost, Heinz; and Pilz, Hans, to Rohm GmbH. Lubricating oil additives. 4,229,311, Cl. 252-50.000.

Werner, John. Miniature railroad uncoupling apparatus. 4,228,907, Cl. 213-75.0TC.

Werner, Paul, to Keiper Automobiltechnik GmbH & Co. KG. Anchoring arrangement for safety belts in a motor vehicle. 4,229,041, Cl. 297-468.000.

Wesche, Karlhans; Schubert, Peter H.; and Glitza, Horst W. Method of producing sand-lime bricks with a low bulk density. 4,229,393, Cl. 264-42.000.
Wessel, Wolf: *See—*
Engel, Gerhard; and Wessel, Wolf, 4,228,680, Cl. 73-119.00A.
West, Edmund J.: *See—*
Dawson, David G.; Osmond, Desmond W. J.; Skinner, Maurice W.; and West, Edmund J., 4,229,224, Cl. 106-90.000.
West Electric Company, Ltd.: *See—*
Iwata, Hiroshi, 4,229,092, Cl. 354-198.000.
West Virginia Armature Company: *See—*
Nelson, Robert C., 4,229,780, Cl. 362-218.000.
Western Electric Company, Inc.: *See—*
Gellatly, John S; and Richter, Fred T., 4,229,155, Cl. 425-114.000.
Loesch, Robert P., 4,229,691, Cl. 324-51.000.
Western States Machine Company, The: *See—*
Bange, Joseph B., 4,229,298, Cl. 210-787.000.
Westinghouse Electric Corp.: *See—*
Frank, Joseph M.; and Hufnagel, Robert A., 4,228,593, Cl. 33-178.00F.
Garrett, Steven H., 4,229,796, Cl. 364-507.000.
Healy, Lawrence G., 4,229,762, Cl. 358-100.000.
McAllister, William A., 4,229,673, Cl. 313-225.000.
Miller, Robert C., 4,229,775, Cl. 361-210.000.
Petro, John, 4,229,678, Cl. 315-73.000.
Petrosky, Kenneth J.; and Wilson, James H., 4,229,697, Cl. 324-244.000.
Smith, Winthrop W., 4,229,739, Cl. 343-100.0SA.
Vaill, Ronald E.; and Phillips, William D., 4,229,259, Cl. 176-78.000.
Wafer, John A.; and Maier, Alfred E., 4,229,630, Cl. 200-144.00B.
Westlane Industries, Inc.: *See—*
Harrow, George A., 4,229,126, Cl. 408-63.000.
Westwood Pharmaceuticals, Inc.: *See—*
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,229,452, Cl. 424-250.000.
Wetzel, Klaus, to Siemens Aktiengesellschaft. Process and a circuit arrangement for the control of the primary current in coil ignition systems of motor vehicles. 4,228,779, Cl. 123-652.000.
Weyerhaeuser Company: *See—*
Meredith, Michael D., 4,229,252, Cl. 162-65.000.
Wezenberg, Arnold: *See—*
Wijffels, Joannes B.; Pegels, Abraham A.; and Wezenberg, Arnold, 4,229,418, Cl. 422-191.000.
Wheaton, Robert B.; and Van Kirk, James W., to Whirlpool Corporation. Wet oxidation system employing phase separating reactor. 4,229,296, Cl. 210-758.000.
Whipple, David L., to Data General Corporation. Floating point processor having concurrent exponent/mantissa operation. 4,229,801, Cl. 364-748.000.
Whirlpool Corporation: *See—*
Barnard, Walter C., 4,228,923, Cl. 222-52.000.
Carr, Keith E., 4,228,934, Cl. 222-412.000.
Dingler, Geoffrey L.; and Johnson, Philip P., 4,228,962, Cl. 241-46.00R.
Wheaton, Robert B.; and Van Kirk, James W., 4,229,296, Cl. 210-758.000.
White Consolidated Industries, Inc.: *See—*
Volpe, Richard L., 4,228,994, Cl. 271-250.000.
White, James A.; and Maynard, Thomas C., to Nalco Chemical Co. Corrosion control method using methoxypropylamine (mopa) in water-free petroleum and petrochemical process units. 4,229,284, Cl. 208-348.000.
White, Mary W.: *See—*
Flake, Duane W., 4,229,223, Cl. 106-88.000.
Whitehouse, Harry S., to Procter & Gamble Company, The. Radioactive scanning agents with hydroquinone stabilizer. 4,229,427, Cl. 424-1.000.
Whittemore, Robert G.: *See—*
Covington, James W.; and Whittemore, Robert G., 4,229,422, Cl. 423-20.000.
Widder, Rudi: *See—*
Boerzel, Paul; Freyberg, Peter; Greif, Norbert; and Widder, Rudi, 4,229,174, Cl. 8-588.000.
Wiedemann, Achim: *See—*
Baumann, Hans-Peter; Karmann, Hans-Georg; and Wiedemann, Achim, 4,229,172, Cl. 8-533.000.
Wiezer, Hartmut: *See—*
Mayer, Norbert; Pfahler, Gerhard; Scheidl, Franz; and Wiezer, Hartmut, 4,229,382, Cl. 260-930.000.
Wijffels, Joannes B.; Pegels, Abraham A.; and Wezenberg, Arnold, to Shell Oil Company. Apparatus for the catalytic treatment of hydrocarbons. 4,229,418, Cl. 422-191.000.
Wikelski, Karl W.; and Tyson, Henry K., to El Paso Polyolefins Company. Lubrication system for reciprocating plunger compressors. 4,229,011, Cl. 277-72.0FM.
Wiklund, Klas R.; and Ericsson, Lars A., to AGA Aktiebolag. Method and apparatus for balancing out disturbances in distance measuring systems. 4,229,102, Cl. 356-5.000.
Wilbarg, Robert R.: *See—*
Hansen, Thomas A.; Johnson, Claude, Jr.; and Wilbarg, Robert R., 4,229,233, Cl. 148-1.500.
Wilcox, Earl H., Jr. Automatic sheet collator. 4,228,996, Cl. 271-297.000.
Wild, Gerald, to Platt Saco Lowell Limited. Dust removal in an opening and cleaning apparatus for fibrous materials. 4,229,285, Cl. 209-3.000.
Wildhardt, Jurgen: *See—*
Walch, Axel; Wildhardt, Jurgen; and Beissel, Dieter, 4,229,291, Cl. 210-23.00F.
Wilfert, Karl, deceased: *See—*
Schmid, Walter; Wilfert, Karl, deceased; and Wilfert, Thomas, legal heir, 4,229,021, Cl. 280-787.000.
Wilfert, Thomas, legal heir: *See—*
Schmid, Walter; Wilfert, Karl, deceased; and Wilfert, Thomas, legal heir, 4,229,021, Cl. 280-787.000.
Will Ross, Inc.: *See—*
Bryson, John D., 4,229,415, Cl. 422-109.000.
Williams, Bolie C., III, to Cameron Iron Works, Inc. Variable bore packer assembly for ram-type blowout preventers. 4,229,012, Cl. 277-127.000.
Williams, Ernest E.; and Brennan, William M., to Rockwell International Corporation. Universal circuit board holding apparatus for facilitating assembly of components. 4,229,778, Cl. 361-399.000.
Williams, Fred G.: *See—*
Mullerheim, Steven B.; and Williams, Fred G., 4,229,202, Cl. 71-8.000.
Williams, Marvin H.: *See—*
LaBarge, Robert L.; and Williams, Marvin H., 4,228,851, Cl. 165-170.000.
Williams, Ted F.; and Cha, Charles L., to Mead Corporation, The. Jet drop printer. 4,229,748, Cl. 346-75.000.
Wilson, Carroll K.: *See—*
Brown, Bruce W.; Copple, Virgil E.; and Wilson, Carroll K., 4,229,485, Cl. 426-305.000.
Wilson, Donald C. Flying saucer toy. 4,228,616, Cl. 46-228.000.
Wilson, Fred A.: *See—*
Oberrecht, David A.; and Wilson, Fred A., 4,229,024, Cl. 285-98.000.
Wilson, Gerald L.; and Otten, David M. Power angle relay to measure and respond to the power angle of a synchronous generator. 4,229,694, Cl. 324-158.0MG.
Wilson, James H.: *See—*
Petrosky, Kenneth J.; and Wilson, James H., 4,229,697, Cl. 324-244.000.
Wilson, William I. Abrasive bodies. 4,229,186, Cl. 51-297.000.
Wiltshire, Arthur J.; Nara, Harry R.; Le Breton, Edward T.; and Bliley, Ward L., to Structural Fibers, Inc. Tank closure assembly. 4,228,575, Cl. 29-407.000.
Winiasz, Michael E. Speed reducer. 4,228,698, Cl. 74-805.000.
Winter, Joseph; Tyler, Derek E.; and Pryor, Michael J., to Olin Corporation. Method for the preparation of thixotropic slurries. 4,229,210, Cl. 75-10.00R.
Wirt, Leslie S., to Lockheed Corporation. Noise barrier. 4,228,867, Cl. 181-210.000.
Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,229,357, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,229,358, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,229,359, Cl. 260-397.200.
Wise, David J.: *See—*
Comperatore, John A.; Black, Edward D.; and Wise, David J., 4,229,201, Cl. 65-287.000.
Witt, August F.; and Raman, Ramaswamy V., to Massachusetts Institute of Technology. Method of forming a laminated ribbon structure. 4,229,231, Cl. 148-1.500.
Wittmann, Erwin J.: *See—*
Harwood, Leopold A.; and Wittmann, Erwin J., 4,229,759, Cl. 358-19.000.
Wojcik, Charles K. Epicyclic gear system and driving means therefor. 4,229,152, Cl. 418-61.00R.
Wolf, David. Safety ski pole. 4,229,016, Cl. 280-821.000.
Wolf, Gunther: *See—*
Dislich, Helmut; Hinz, Paul; and Wolf, Gunther, 4,229,491, Cl. 427-160.000.
Wolff, Siegfried; and Tan, Ewe H., to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Cross-linkable rubber mixtures containing silicate fillers and process for cross-linking. 4,229,333, Cl. 260-23.70M.
Woltmann, Reinhard: *See—*
Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, 4,228,769, Cl. 123-52.00M.
Wood, Robert A. R., to Teleflex Incorporated. Boat steering assembly. 4,228,757, Cl. 114-150.000.
Woodbury, Larry A., to Deere & Company. Tractor transmission shift control. 4,228,879, Cl. 192-4.00A.
Woodruff, Roger D., to Champion Corporation. Reel loader construction. 4,228,967, Cl. 242-86.50R.
Woollam, John A., to United States of America, National Aeronautics and Space Administration. Atomic hydrogen storage method and apparatus. 4,229,196, Cl. 62-40.000.
Wray, William R., to Polaroid Corporation. Two speed loop control arrangement. 4,229,083, Cl. 352-14.000.
Wu, Ching-Yong; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Converting ethylene and propylene to the glycol using t.butyl hydroperoxide in a two-phase liquid reactant. 4,229,601, Cl. 568-860.000.

Wu, Chung P.; and Smeltzer, Ronald K., to RCA Corporation. Low-resistivity polycrystalline silicon film. 4,229,502, Cl. 428-446.000.

Wu, Jeng-Shyong. Packing device for decorative string set. 4,228,896, Cl. 206-420.000.

Wuerzer, Bruno: *See—*
Theobald, Hans; Wuerzer, Bruno; and Kiehs, Karl, 4,229,205, Cl. 71-92.000.

Wurmb, Rolf: *See—*
Sterzel, Hans-Josef; Wurmb, Rolf; Schmidt, Franz; and Seiler, Erhard, 4,229,553, Cl. 525-438.000.

Wysocki, Lawrence S., to Champion International Corporation. Food carton for microwave heating. 4,228,945, Cl. 229-30.000.

Xerox Corporation: *See—*
Hamlin, Thomas J.; and George, Clifford L., 4,229,101, Cl. 355-77.000.
Lenhard, Myron J.; Rees, James D.; and Xerox Corporation, 4,229,512, Cl. 430-106.000.
Tamai, Masayoshi, 4,229,751, Cl. 346-140.00R.

Yagi, Akihiro; Kuchinomachi, Yasuo; and Kodama, Hiroyuki, to Agency of Industrial Science & Technology. Biofeedback device for recognition of α wave component and muscle potential component. 4,228,807, Cl. 128-732.000.

Yajima, Kenji, to Kabushiki Kaisha Daini Seikosha. Click mechanism of a timepiece. 4,228,647, Cl. 368-185.000.

Yakovlev, Mikhail N.: *See—*
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N., 4,229,560, Cl. 528-4.000.

Yamada, Hideaki; Shimizu, Sakayu; and Tani, Yoshiki, to Amano Pharmaceutical Co. Ltd. Process for preparing acyl-CoA synthetase LCF-18. 4,229,538, Cl. 435-193.000.

Yamada, Keijyu: *See—*
Kikuchi, Makoto; and Yamada, Keijyu, 4,229,167, Cl. 433-74.000.

Yamada, Takao: *See—*
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Yamada, Yu; Inoue, Mutsuhiro; Arai, Toshio; Omi, Kokichi; Suzuki, Hiroaki; and Kuwayama, Tetsuro, to Canon Kabushiki Kaisha. Film reader. 4,229,085, Cl. 353-75.000.

Yamaga, Eiichi: *See—*
Uchiyama, Yasuji; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,228,712, Cl. 84-1.010.

Yamaguchi, Tadanori: *See—*
Sato, Shuichi; Yamaguchi, Tadanori; and Sachitano, Jack, 4,229,756, Cl. 357-42.000.

Yamaguchi, Yukio; Ishihara, Kenji; and Yonekura, Kikuo, to Toho Gasu Kabushiki Kaisha; and Kabushiki Kaisha Togowa Gomu Seizosho. Method of making thermally expansible rubber tubes for use in self-closing gas pipes and pipe joints. 4,229,341, Cl. 260-42.160.

Yamamoto, Kazuo: *See—*
Ikesue, Haruyuki; and Yamamoto, Kazuo, 4,228,567, Cl. 24-230.0AL.

Yamamoto, Masaaki: *See—*
Takeda, Renzo; Uchikawa, Sadao; Kurihara, Kunitoshi; Yamamoto, Masaaki; Yokomi, Michiro; Yamashita, Junichi; and Takamatsu, Jun, 4,229,258, Cl. 176-76.000.

Yamamoto, Syunichi: *See—*
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Yamanashi, Chusaku: *See—*
Arima, Tatsuhiro; and Yamanashi, Chusaku, 4,228,971, Cl. 242-107.600.

Yamashita, Junichi: *See—*
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Yamashita, Masayoshi: *See—*
Nishimura, Kenji; Uchiumi, Shinichiro; Fujii, Kozo; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,229,589, Cl. 560-193.000.

Yamauchi, Terukazu; Nishio, Katsufumi; Niino, Fusao; and Murasawa, Toyoaki, to Matsushita Electric Industrial Co., Ltd. Receptacle for motor-driven food processor. 4,228,963, Cl. 241-92.000.

Yamazaki, Hisashi: *See—*
Watanabe, Kikuo; Kazino, Mitsutaka; and Yamazaki, Hisashi, 4,229,683, Cl. 318-466.000.

Yanagimoto, Akira: *See—*
Shiozaki, Masahiro; Nawata, Kiyoshi; Tsunawaki, Kiyokazu; Tsubaki, Kazumi; Yanagimoto, Akira; and Kumazawa, Shunichi, 4,229,552, Cl. 525-437.000.

Yanagioka, Hiroshi: *See—*
Kanai, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, 4,229,417, Cl. 422-176.000.

Yasui, Toshihiro: *See—*
Takemoto, Yoshinori; Yasui, Toshihiro; Fujii, Kyoichi; Tanaka, Hiroshi; and Hirama, Tatsuyuki, 4,229,446, Cl. 424-230.000.

Yasuike, Akio: *See—*
Nagumo, Tadashi; Yasuike, Akio; and Kataoka, Hiroshi, 4,229,395, Cl. 264-51.000.

Yasuzawa, Kohei: *See—*
Konii, Susumu; Yoshimura, Yukio; Nanaumi, Ken; Yasuzawa, Kohei; Yoshida, Takeshi; and Shinko, Toyotaro, 4,229,330, Cl. 260-19.00R.

Yates, August B., to Webb, J. Talmadge. Protective device for instruments and locking of aircraft controls. 4,228,974, Cl. 244-224.000.

Yates, Dow. Chlorine generator and method. 4,229,272, Cl. 204-128.000.

Yazaki, Akira: *See—*
Tabushi, Iwao; Sugimoto, Hiroyuki; and Yazaki, Akira, 4,229,356, Cl. 260-396.00K.

Yazaki Corporation: *See—*
Yoshizawa, Masaaki, 4,229,063, Cl. 339-95.00R.

Yeda Research and Development Co., Ltd.: *See—*
Nudelman, Abraham; and Patchornik, Abraham, 4,229,363, Cl. 260-454.000.
Nudelman, Abraham; and Patchornik, Abraham, 4,229,574, Cl. 544-21.000.

Yokomi, Michiro: *See—*
Takeda, Renzo; Uchikawa, Sadao; Kurihara, Kunitoshi; Yamamoto, Masaaki; Yokomi, Michiro; Yamashita, Junichi; and Takamatsu, Jun, 4,229,258, Cl. 176-76.000.

Yokomori, Shinji: *See—*
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,228,811, Cl. 133-3.00R.

Yonehara, Hiroshi: *See—*
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Yonekura, Kikuo: *See—*
Yamaguchi, Yukio; Ishihara, Kenji; and Yonekura, Kikuo, 4,229,341, Cl. 260-42.160.

Yonemoto, Tomoo: *See—*
Kitai, Kiyoshi; Onda, Eiichi; Yonemoto, Tomoo; and Nagaoka, Shinji, 4,229,089, Cl. 354-25.000.

Yoneyama, Masakazu; and Kishimoto, Shinzo, to Fuji Photo Film Co., Ltd. Photographic light sensitive material with antistatic property. 4,229,524, Cl. 430-536.000.

Yorde Machine Products Company, The: *See—*
Deminski, Richard M., 4,228,820, Cl. 137-514.300.

Yoshida, Hiroshi; Tabara, Nobuo; and Aoki, Keiji, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling internal combustion engines. 4,229,793, Cl. 364-431.000.

Yoshida, Kenji: *See—*
Shigematsu, Taichiro; Yoshida, Kenji; Nakazawa, Makoto; Kasugai, Hiroshi; and Tsuda, Masataka, 4,229,461, Cl. 424-270.000.

Yoshida Kogyo KK: *See—*
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Yoshida, Masatoshi: *See—*
Fukuta, Kenji; Ono-Oka, Ryuzo; Yoshida, Masatoshi; Saito, Kazuhisa; and Kosuda, Hiroyuki, 4,229,397, Cl. 264-113.000.

Yoshida, Michihiro: *See—*
Kanai, Toshio; Yanagioka, Hiroshi; Idemura, Hideo; Sugiyama, Hiroshi; Kogawa, Yoshio; Yoshida, Michihiro; Kitamura, Mitsugu; and Sugiya, Teruo, 4,229,417, Cl. 422-176.000.

Yoshida, Takeshi: *See—*
Konii, Susumu; Yoshimura, Yukio; Nanaumi, Ken; Yasuzawa, Kohei; Yoshida, Takeshi; and Shinko, Toyotaro, 4,229,330, Cl. 260-19.00R.

Yoshida, Toshio: *See—*
Kobayashi, Toyohiko; Tsuruta, Haruki; and Yoshida, Toshio, 4,229,600, Cl. 568-820.000.

Yoshikumi, Chikao: *See—*
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,229,570, Cl. 536-18.000.

Yoshimura, Yukio: *See—*
Konii, Susumu; Yoshimura, Yukio; Nanaumi, Ken; Yasuzawa, Kohei; Yoshida, Takeshi; and Shinko, Toyotaro, 4,229,330, Cl. 260-19.00R.

Yoshizawa, Masaaki, to Yazaki Corporation. Pressure terminal for use with aluminum wire. 4,229,063, Cl. 339-95.00R.

Young, John: *See—*
Jones, Gordon H.; and Young, John, 4,229,478, Cl. 424-331.000.

Yu, John P., to RCA Corporation. RF Connector assembly with provision for low frequency isolation and RFI reduction. 4,229,714, Cl. 333-12.000.

Yuasa, Yoshio; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Exposure time controlling system. 4,229,088, Cl. 354-23.00D.

Zahnradfabrik Friedrichshafen, A.G.: *See—*
Jablonsky, Erich, 4,228,696, Cl. 74-499.000.

Zaremba, Tadeusz: *See—*
Koloczek, Wiktor; Dobaj, Edward; and Zaremba, Tadeusz, 4,229,721, Cl. 336-133.000.

Zeitter, Charles R.; and Thomas, John F., to Packaging Corporation of America. Reclosable carton and blank therefor. 4,228,898, Cl. 206-621.000.

Zellweger Ltd.: *See—*
Luethi, Peter; and Steinmetz, Werner, 4,228,814, Cl. 134-58.00R.

Zepeda, Lamberto C. Garden hose thread protector. 4,228,823, Cl. 138-96.00R.

Zerlauth, Hellmuth, to Niveau AG. Device for preventing skidding and for increasing the grip of vehicle wheels on ice and snow. 4,228,838, Cl. 152-216.000.

Zernig, Norbert: *See—*
Herschmann, Otto; Zernig, Norbert; Holthausen, Dieter; Stock, Hugo; and Tholen, Paul, 4,228,655, Cl. 60-602.000.

Zhadanov, Semen. Water impeller brush and massage. 4,228,558, Cl. 15-29.000.

Zhestovsky, Gennady P.: *See*—
Tmenov, Dzantemir N.; Svintsov, Nikolai I.; Shapovalova, Lidia P.; Tabakov, Albert V.; Dvoretsky, Mikhail L.; Vasiliev, Gavril I.; Zhestovsky, Gennady P.; Kandalova, Valentina D.; Korotkevich, Boris S.; Lukashov, Anatoly I.; Lukyanenko, Valery P.; Polataiko, Roman I.; Malov, Evgeny A.; and Shmuk, Jury A., 4,229,604, Cl. 585-445.000.

Ziegenhorn, Joachim; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; and Bergmeyer, Hans U., to Boehringer Mannheim GmbH. Process and reagent for the kinetic determination of enzyme substrates. 4,229,527, Cl. 435-11.000.

Zingerman, Bryant N.: *See*—
Chiu, George T.; Kitcher, James R.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,229,247, Cl. 156-643.000.

Zinno, Oscar; and Tocchella, Antonio, to Costruzioni Meccaniche Industriali Genovesi C.M.I. S.p.A. Device for the rotation of containers. 4,229,034, Cl. 294-81.0SF.

Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,229,368, Cl. 260-465.00D.
Henrick, Clive A., 4,229,352, Cl. 260-326.430.

Zollinger, Roger F.: *See*—
Irick, Dan F.; and Zollinger, Roger F., 4,229,693, Cl. 324-73.0PC.

Zouck, Robert L.: *See*—
Kahn, Marvin J.; Malchodi, Robert J.; Paine, Joseph P.; Rogers, Milton J.; and Zouck, Robert L., 4,228,737, Cl. 102-3.000.

Zuckert, Bertram, to Vianova Kunstharz, A.G. Process for producing water-emulsifiable air-drying binders, the binders, and emulsions made therefrom. 4,229,331, Cl. 260-20.000.

Zupan, John T.: *See*—
Heldwein, Carl A.; Jekel, Richard N.; Sampson, Stephen R.; and Zupan, John T., 4,229,737, Cl. 343-6.00R.

Zweigle, Maurice L., to Dow Chemical Company, The. Purification of cellulose ether reaction product. 4,229,572, Cl. 536-89.000.

Zwierszowski, Thomas P.: *See*—
Smith, Galyn F.; and Zwierszowski, Thomas P., 4,229,420, Cl. 422-310.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF OCTOBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams, Charles D., to Du Pont de Nemours, E. I., and Company. Process for preparing N-alkoxycarbonyl-N-alkylcyanamide. Re. 30,421, Cl. 560-159.000.

Bayer Aktiengesellschaft: *See*—
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; and Horstmann, Harald, Re. 30,420, Cl. 424-273.00P.

Benson-France: *See*—
Mourier, Jean, Re. 30,422, Cl. 346-112.000.

Caudill, Donald L.: *See*—
Crankshaw, Michael; Kucheck, Leo; and Caudill, Donald L., Re. 30,419, Cl. 156-249.000.

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Ford, Eric H., to Lumenition Limited. Opto-electronic ignition systems for internal combustion engines. Re. 30,418, Cl. 123-651.000.

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Beane, Richard M., 257,436, Cl. D16-65.000.

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Beane, Richard M., to American Optical Corporation. Pair of spectacles. 257,436, 10-21-80, Cl. D16-65.000.

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Sakamoto, Masakazu; and Doi, Tetsuyuki, 257,445, Cl. D22-25.000.

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Horii, Koji, 257,439, Cl. D21-127.000.

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Schmitt, Fred: *See*—
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Sotolongo, Thomas J., to AMP Incorporated. Cover for floor outlet. 257,424, 10-21-80, Cl. D8-353.000.
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Talty, Francis P. Combined wristband and handcover. 257,408, 10-21-80, Cl. D2-361.000.
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Trend Line Furniture Corporation: *See*—
Beall, Lester, Jr., 257,413, Cl. D6-62.000.
Tsuyuki, Akio, to Tomy Corporation. Holder unit for a drawing toy. 257,438, 10-21-80, Cl. D21-59.000.
Vanguard Plastics Ltd.: *See*—
Follows, James S., 257,420, Cl. D8-380.000.
W. R. Grace & Co.: *See*—
Hickey, Victor F., 257,430, Cl. D12-60.000.
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ISSUED OCTOBER 21, 1980

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